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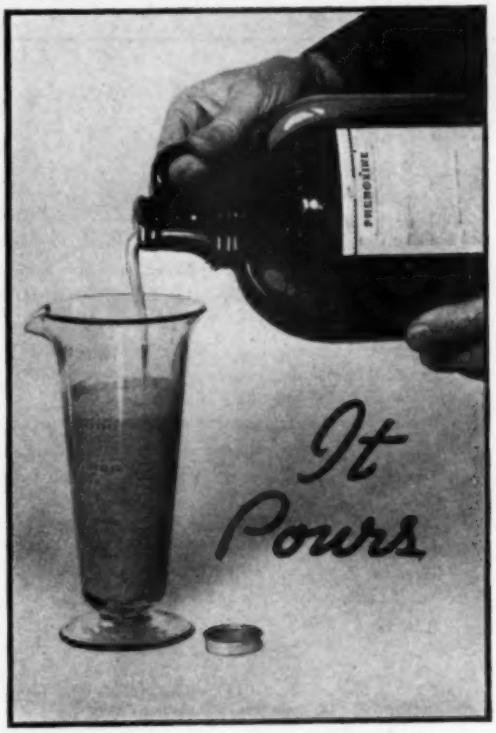

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Veterinary Science Has War Job

W. R. WOOLDRIDGE, Ph.D., M.Sc., M.R.C.V.S.
London, England

BRITAIN'S veterinary profession has shown its progressive spirit during the last fifteen years by the ready way in which it has modified its practice, so that its major attention, given to the industrial horse at the turn of the century and to household animals soon after World War I, has been increasingly directed to the control of the diseases of farmstock. During the present war, the profession's manpower has been reserved and its energies devoted in large measure to assisting the farm livestock industry.

Certain diseases have a high incidence among cattle in Britain. For instance, it is estimated that tuberculosis affects about 40 per cent of Britain's dairy cows, and that contagious abortion is equally prevalent, giving rise to premature births of about 10 per cent of all calvings; that the incidence of mastitis is between 25 and 30 per cent and that about one third of dairy cows produce a calf every eighteen months to two years, instead of annually, because of the prevalence of temporary infertility.

With such a high incidence of these diseases, it is not possible to eradicate them by the adoption of a strict slaughter policy of all infected animals. Furthermore, until recently, it has been considered inadvisable to attempt their control simultaneously.

The Government has made efforts to reduce the incidence of tuberculosis in cows since the early twenties, when it decreed that all cows affected with chronic cough, gross emaciation, or other signs of clinical tuberculosis should be slaughtered, and compensation paid. Together with this elimination of advanced cases, steps were taken to encourage the development of tuberculosis-free herds, through the regular application of the tuberculin test and the granting of a higher price for the milk from such herds.

Although these attempts to control tuberculosis have met with some success and certain areas of the country now have a low incidence of the disease in their dairy cows, tuberculosis-free areas have not as yet been proclaimed in the country, due partly to the difficult conditions imposed upon agriculture by the war.

A plan has been started to control the ravages of contagious abortion, mastitis, sterility, and Johne's disease in dairy cattle. This is a voluntary scheme, organized by the National Veterinary Medical Association, in conjunction with the National Farmers' Unions of England and Scotland and the Animal Health Division of the Ministry of Agriculture, whereby undertakings may be made between farmers and veterinary practitioners for the quarterly inspection by the veterinary surgeon of all animals in the herds.

The practitioner makes such other visits

President of the National Veterinary Medical Association of Great Britain.

to the farm as may be necessary for this control work. Certain facilities are granted by the Government to those coming into the scheme, and the veterinary profession has agreed to accept reduced fees as part of its contribution towards the war effort.

This scheme has been in operation for only a few months; as yet, it includes but a small proportion of the dairy cattle. There is no doubt that it is doing considerable good in establishing conditions whereby veterinary advice is sought early by the farmer on the best ways of keeping cattle in health and preventing disease or controlling it in its early stages.

Under the scheme, free laboratory facilities are made available for the examination of milks, to ascertain the type of organism responsible for mastitis; and for the examination of blood, for the detection of animals infected with contagious abortion.

The practitioner is free to choose his own methods for the control of mastitis, but he is encouraged to use sulfonamides and suitable udder injections, *e.g.*, of the flavines in appropriate cases. Contagious abortion is controlled either by pursuing a method of eradication based upon blood tests, or by vaccination, using either the American strain 19 or the Wye strain 45/20. The latter, developed by McEwen, is similar to the American strain, in that its virulence is attenuated, but it does not produce agglutinins in the blood.

The control of temporary infertility has led to a considerable increase in the regular examination of the genital organs of the cow, to establish the presence of a fetus or ascertain, and treat if possible, the cause of infertility. This practice has a further advantage in that it encourages the farmer to keep accurate breeding records of his stock.

A further development in the breeding of dairy stock has been the establishment by the Government of two small experimental stations to try methods of artificial insemination in cattle so as to ascertain the best conditions for the development of this practice in Britain.

During the last twenty years, considerable research has been carried out on the diseases of sheep in Britain, and much headway has been made. Such diseases as lamb dysentery, pulpy kidney disease, "pining," braxy, pregnancy toxemia, "strike," and various parasitic infestations have been carefully investigated, and the majority of these diseases can now be prevented.

Various biological products are available to veterinary surgeons and sheep farmers at a reasonable cost, but there is still room for improvement in the veterinary service available to sheep farmers, especially those on hill farms. At the moment, two Government committees are inquiring into the hill sheep industry, in England and Wales and in Scotland, respectively.

The war has resulted in a diminution of pigs in the country, largely because of difficulties in providing feedstuffs. Nevertheless, research has been actively continued on various diseases, particularly swine fever [hog cholera] and certain parasitic diseases. At present, a large scale field trial is being made on the prevention of swine fever by the use of the crystal violet vaccine,

Another extensive livestock industry which, unfortunately, has had to be reduced considerably because of lack of feeding stuffs, is poultry keeping. Care has been taken to reduce so that only the best of breeding stocks are retained, free, as far as possible, from disease.

The Ministry of Agriculture has arranged that these selected stocks become accredited breeding flocks, and receive extra rations to enable them to be preserved in good health for post-war development. The veterinary profession has been playing a useful part in the culling of the unwanted birds, and more particularly in the selection of those to be retained.

At the same time, there has been a considerable growth in the number of poultry and rabbits kept by householders in towns, these animals being fed largely upon household scraps. This has led to the formation of many clubs for poultry and rabbit keepers, and the urban veterinary practitioner

has given much helpful advice to clubs about their animals.

Another important wartime development has been the greater consideration that the owner of livestock has had to give to feeding. Before the war, he was able to buy imported concentrates and balanced rations, but now he must grow a considerable amount of the feeds required for winter feeding. He has had to apply scientific knowledge to enable him to feed these feeds in balanced mixtures, and to allow for the anticipated production of milk, meat, and eggs. This has meant considerable education of the farmer, in which the veterinary profession has played an important part.

Prior to the war, the veterinary profession scarcely ever participated in public lectures, demonstrations, and so on. Now, because of the urgency of the plans for the production of more feedstuffs of animal origin and the need for proper feeding and a greater control of diseases of animals, the profession has participated fully in educational publicity, with the most gratifying results. Not only has the farmer benefited materially, but he has acquired a much greater appreciation of the value of the work of the profession in the nation's economy.

"Power and Sausage"—Dual Purpose for Horses under Hitler

The Jan. 12, 1943 issue of Folkviljan, Stockholm, contains a front page article which states *inter alia* that during the previous session a Social-Democrat member of the Swedish Parliament, Andersson, said in Rixo that "one wonders at the large export of horses from Sweden." Horsepower has the advantage over manpower that sausage can be made of its producer when its strength declines, and horsepower is needed in Hitler Germany for sausage too. Just consider all the horses which have been eaten by the German divisions surrounded at Stalingrad for lack of other food. Possibly the small demand for horses in Sweden has caused the mass export of horses which is now taking place. An advertisement by the State Export Institute of the Royal Agricultural Board in Jordbrukarnas Foreningsbladet, No. 2, informs horse owners in Scania, Holland, Smaland, West Sweden and Narke that the purchase of horses intended for export will take place at forty-one different places between January 11 and January 22.—*From "Public Health Under Hitler." J. A. M. A., (March 13, 1943): 847.*

Pastures Are Important

With an ever increasing shortage of feedstuffs for our farm animals, it is absolutely necessary that the fullest use be made of pasture grass this summer in feeding all classes of livestock. To do this requires good pasture management. Since soils and pasture herbage vary widely, it is impossible to present a program for pasture improvement which will apply to all conditions. The experiment station in each state will gladly give information regarding this problem. A few dollars and a few hours time spent in the production of better forage will yield large returns in beef, pork, mutton and milk.

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Norepol is a synthetic rubber-like product made from soybean, corn and other vegetable oils discovered by chemists of the United States Department of Agriculture at the Northern Regional Laboratory, Peoria, Ill. It is resistant to abrasion and impervious to water, but lacks the stretch and tensile strength specified for perfect rubber substitutes. However, it will replace a great deal of rubber used for tubing, hose, heels, gaskets, fruit-jar rings, and other essential commodities which required large quantities of natural rubber. The new compound is now produced commercially.

"Just around the corner" is now applicable to the scarcity of things to eat.

The Economic and Nutritional Importance of Bovine Hepatic Disturbances

L. D. FREDERICK, D.V.M.
Chicago, Illinois

DURING THE PAST two years, widespread interest on this subject has developed in nutritional, pathological, and meat packing circles, due to the heavy loss of beef and calf livers which are condemned, by the inspectors of the Meat Inspection Division of the United States Bureau of Animal Industry in packing plants operating under federal inspection, because they are affected with telangiectasis, so-called sawdust condition, abscesses, and distomiasis. This interest has been stimulated by two major factors: *viz.:* economic and nutritional, which are closely related in significance.

Liver has long been known to be an excellent glandular meat food containing a high percentage of protein of excellent biological value. Scientific research later developed data on its antianemic factor and its importance in medicine. Then, with the more recent discovery that liver tissue is an excellent source of several of the more important vitamins, the consumer demand materially increased and resulted in an inevitable advance in its monetary value. This interest was further shown by the numerous researches and articles on phases of bovine hepatic disturbances which were presented at professional and similar group meetings and published in various periodicals.

The economic importance of the loss of this valuable food product is well depicted in the records of the Meat Inspection Division of the United States Bureau of Animal Industry.

The monetary loss to the livestock and packing industry as a whole is exemplified by the evaluation of this loss from these designated causes during the past seven years in pounds of product and in dollars and cents as follows: 3,674,514 beef livers condemned for abscesses, at an average of 10 lb. per liver, equal 36,745,140 lb. at an Aug. 11, 1942, average wholesale value of 28c per lb. equal $10,288,639.20. At the same average weight and basis of value, the 1,395,672 livers condemned for telangiectasis amount to 13,956,720 lb., or $3,907,881.60. Likewise, those condemned for sawdust condition amount to 5,267,800 lb., or $1,474,984. On the same basis, the loss from distomiasis amounts to 9,064,220 lb., or $2,537,981.60. This makes a grand total loss in the seven-year period, for causes designated, of 65,033,880 lb., or $18,209,486.40. Therefore, an average annual loss from these causes amounts to 9,290,554 lb., at current valuation equal to $2,601,355.20. We will not undertake to postulate how many individuals, whether they be soldiers, sailors, or civilians, this amount of liver would serve, nor how many bomber planes or other war materials the money lost would provide, nor cite other analogies; but suffice it to say, it is a very sizable and worthwhile amount. We believe the foregoing citation of volume figures and monetary evaluation quite fully covers the usual consideration of the economic phase of such a problem; but there is another phase, very closely allied, which is discussed in the following part of this consideration, namely, that of the nutritional significance and importance of liver in the diet of man and animals. The consumer demand for beef liver, in particular, at the present time cannot be met with current production; consequently, a shortage exists.

The importance and essentiality of a normally developed and functioning liver in the proper digestion and assimilation of food,

Presented before the Section on Sanitary Science and Food Hygiene, at the seventy-ninth annual meeting of the American Veterinary Medical Association, Chicago, Ill., August 24-27, 1942.

Chief Veterinarian, Swift & Company, Chicago.

particularly fat, is considered to be fairly well understood. In addition to being one of the major organs furnishing essential digestive juices, the liver serves as a storehouse for reserve energy factors, glycogen, vitamins, etc., is the major detoxifying organ of the animal mechanism, plays a considerable rôle in maintaining the normal composition and purity of the blood, and holds a prominent position in the general metabolism. It is known to be one of the most valuable glandular meat foods derived from the domestic animals slaughtered for food. The average dietary, chemical analysis of fresh beef liver is 19.7 per cent protein, 6.0 per cent carbohydrates, 3.2 per cent fat, 1.4 per cent ash, 0.008 per cent calcium, 0.420 per cent phosphorus, 68 mg. per kg. of iron, 15 mg. per kg. of manganese, 76 mg. per kg. of copper, 112 mg. per kg. of zinc, 17 mg. per kg. of aluminum, and 0.019 per cent magnesium.[1] The protein content is considered, in nutritional circles, to be one of the highest in biological value, being made up of 11 of the amino acids, according to Block and Bolling.[2]

The mineral content is also valuable nutritionally. The elements contained are in an organic form and readily usable by the consuming animal organism. The highest in significance are the iron, copper, zinc, and phosphorus. The calcium content is considered low, and diets containing large amounts of liver must be supplemented with additional calcium.

The vitamin content of liver is interesting to review, especially as regards the great variety and amount of these important factors in nutrition. The major part of this information has been developed in recent years, not because of lack of interest earlier, but following the development of fairly accurate methods of analysis, both qualitative and quantitative, of the various vitamins. The work of Wiseman and Elvehjem[1] shows that the vitamin A content of fresh beef liver varies considerably, from 1,000 to 16,000 I. U. (international units) per 100 Gm. Even with this wide variation, it is still an outstanding natural food source of this essential factor at the lower levels. The vitamin D content averages 45 I. U. per 100 Gm.; vitamin E, 9.54 mg. per kg.; and vitamin C, 31 mg. per kg. The vitamin B complex is exceptionally well represented in beef liver. Wiseman and Elvehjem have tabulated this information as follows:

Thiamin	3.8 μg./Gm.
Riboflavin	30.0 μg./Gm.
Nicotinic acid	17.5 mg./100 Gm.
Pantothenic acid	63.0 μg./Gm.
Pyridoxine	7.3 μg./Gm.
Choline	270.0 mg./100 Gm.

The impressive array of the various factors of the B complex in the appreciable amounts shown is the reason why liver substance and liver extract are used as the base for so many of the commercial vitamin B-complex compounds on the pharmaceutical market. This further exemplifies the sound basis for the advice of the physician and veterinarian in prescribing liver in the diet where a vitamin B-complex deficiency actually exists or is suspected. Very few items of food can be classed on the same high nutritional plane as liver for protein, mineral, and vitamin content.

Another item worthy of consideration, closely related to the nutritional aspects of this problem, is the fact that a considerable volume of liver extract for the treatment of various types of anemias, particularly that type known as pernicious anemia, is manufactured from beef liver. The majority of liver extracts produced in the United States come from pork liver. However, as near as we are able to estimate, between 6 and 7 million lb. of beef liver are used annually for the manufacture of this valuable therapeutic agent.

The characteristic gross lesions, as well as the histopathology, in telangiectasis, the so-called sawdust livers, *Bacillus necrophorus* infection, and the common abscessed livers of cattle, are well described by Schoening and Giltner.

[1]Waisman, H. A., and Elvehjem, C. A.: The Vitamin Content of Meat. Burgess Pub. Co. (1941): 22, 33, 38, 45, 80, 103, 131, 159, 173, 193-198.

[2]Block, R. J., and Bolling, Diana: The Determination of the Amino Acids. Burgess Pub. Co. (1940): Table II, p. iii.

TELANGIECTASIS[3]

The cause of telangiectasis remains obscure. The gross lesions in the so-called telang livers are usually observed as dark red, or purplish, depressed areas beneath the capsule which vary in size from a few mm. to 15 mm. or more in diameter. On gross section, the dark areas can be seen distributed through the liver substance. They may involve only one part, or lobe, or the entire organ. The dark areas are soft and spongy in consistency and contain much blood.

Histopathology.[3]—Microscopically, the lesions are found to consist of hemorrhagic areas, varying in size and involving most frequently the capillaries radiating from the central vein, sometimes referred to as capillary angiomatosis. The hemorrhagic areas consist of an upright structure, the meshes of which are filled with blood. As the result of the marked distention and rupture of capillaries, blood cavities or sinuses are formed, many of which may be lined with endothelium. Between these small blood cavitations may be seen remnants of columns of degenerated liver cells. The liver tissue surrounding the hemorrhagic areas is usually practically normal in character.

To the writer's knowledge, no one has ever diagnosed telangiectasis in the living animals. As the cause is not known and no clinical symptomology has been observed or reported, obviously treatment cannot be prescribed. However, progress in studies that have been under way for the past two years, carried on with a view to determining the cause of this and other hepatic disturbances, will be discussed following the presentation of the pathological aspects of these other bovine hepatic disturbances.

SO-CALLED SAWDUST LIVERS[3]

The specific cause of so-called sawdust livers is not known at the present time. The gross lesions in sawdust livers are of the nature of numerous, small, irregular, grayish areas from 2 to 5 mm. or more in diameter, which may be seen beneath the liver capsule and also diffusely distributed through the liver substance.

Histopathology.[3] — Microscopically, small, grayish areas are seen as focal areas of liver cells in various stages of degeneration and necrosis. These areas are infiltrated with cellular elements, usually lymphoid cells, polymorphonuclear leucocytes, and eosinophiles which are seen invading the necrotic foci. Occasionaly, the infiltrating cells may be confined largely to lymphoid cells and fibroblasts, indicating a tendency to chronic changes or healing. Occasional livers show a mixture of small hemorrhagic and grayish areas. The small hemorrhages are frequently seen in the region of the central vein. Some observers believe that the grayish areas, or degenerative changes in the liver cells, may be secondary or may follow the hemorrhagic condition, while others take the opposite view. Occasionally, pyogenic or pus-producing bacteria may invade the necrotic foci and cause small abscessed areas, which doubtless, in some instances, result in one type of liver abscess.

As in the case of telangiectasis, there are no reports of clinical symptoms in animals showing this so-called sawdust condition in their livers *post mortem*. Because the specific cause is not known, preventive treatment cannot be prescribed.

The final disposition of beef and veal livers affected with telangiectasis and so-called sawdust condition by the inspectors of the Meat Inspection Division, United States Bureau of Animal Industry, is clearly covered and defined in the Bureau's circular letter number 1566, dated Sept. 24, 1928.

NECROPHORUS INFECTION OF LIVERS[3]

Necrophorus infection of livers is caused by infection with *Bacillus necrophorus*. Necrophorus lesions of the liver are spherical or irregular, rather sharply defined, nodular areas, yellowish or grayish-yellow, and of a solid, or a compact, brittle consistency. These nodular areas vary from 0.5 to 2 in. in diameter, and occasionally the lesions become fused into a more extensive lesion, involving large areas of the liver tissue. In the earlier stages of the lesions, the necrotic areas are surrounded by reddish zones, which appear later, as the necrotic tissue becomes surrounded by a thick, fibrous capsule. The liver may become four or five times its normal size. In some cases, in the later stages, the necrotic

[3]Schoening, H. W., and Giltner, L. T.: U. S. Dept. Agric., Bureau of Animal Industry, Pathol. Div. Personal communication, (April, 1942).

material may soften and the capsule may fill with pus-like material.

Histopathology.[3] — Microscopically, the involved areas are seen as homogeneous, necrotic centers, surrounded by a zone of inflammatory cells consisting of lymphoid cells, polymorphonuclear leucocytes, large macrophages, and, in the latter stages, fibroblasts, as the lesions tend t incapsulate, and finally become covered with a well-formed capsule. In sections stained for bacteria, masses of radiating filaments of the causative organism seen at the borders of the necrotic areas are sufficiently characteristic to be of considerable aid in diagnosis.

According to Hutyra and Marek,[4] in natural cases, the liver becomes infected by way of the blood stream. In most cases, the bacillus reaches the portal blood from the intestine. It is not essential that any lesions should be produced in the mucous membrane. Therefore, apparently any feedstuffs contaminated by the necrophorus organisms are dangerous, and the avoidance of such contamination is of primary importance in the prevention of this infection.

Symptoms.—According to Berndt,[4] the symptoms are inappetence, high fever, weakness, and pain and fullness of the liver. The animal moves with difficulty, respiration is accelerated and shallow, and pressure over the liver causes pain. After three days, the animal becomes weak and lies down continuously. Respiration is rapid and difficult. There is constipation followed by diarrhea, the abdomen is painful, the temperature falls, jaundice sets in, and the animal soon dies.

In cases where the number of lesions is small or when subsequent processes are less rapid, the symptoms are not severe or there may be no evidence of any disturbance of health.

Treatment.—No specific results of any particular drug have been reported, and the same holds true of biological products. Beneficial results were reported by Farquharson[5] from the sulfa drugs used in other diseases purported to be caused by this same microörganism. We suggest the use of these drugs in treating necrobacillosis of cattle. Prevention of this disease is apparently the most satisfactory, as is the case in other diseases. Strict sanitation and other known preventive measures are in order from the first minute of the calf's life. Infection of the umbilical cord at birth may be causative. Foot rot and allied conditions on the range, in pastures, and in the feedlots are possibly of equal importance. Diseases of other domestic animals caused by this same microörganism may spread to cattle. Good management and sanitation are, therefore, the best preventive measures.

ABSCESSES OF THE LIVER[3]

As in other tissues, abscesses in the liver are caused by invasion of the organ by different types of pyogenic bacteria, of which Streptococcus and Staphylococcus are the most common. The infective organisms may reach the liver through the blood stream by way of the portal circulation and become localized in small centers where liver cells have been injured, or the organisms may reach the liver through injuries caused by foreign bodies or certain types of parasites.

Abscesses of the liver vary considerably in size, number, and extent of involvement. The contents of the abscesses in different cases vary in color and consistency. The color may be green, yellow, reddish-yellow, or green, and the consistency may vary from a liquid or semiliquid to more or less dry or inspissated.

Histopathology.[3] — Microscopically, abscess lesions consist of masses of necrotic, homogeneous material (dead tissue elements mixed with microörganisms) which have been walled off or separated from the healthy tissue by a thick, fibrous, connective tissue capsule.

There are numerous types of pyogenic microorganisms found in liver abscesses and indicated by the investigators as the cause of the abscess. Quite often *B. necrophorus* is found in simple liver abscesses. Gaiger and Davies[6]

[4]Hutyra, F., and Marek, J.: Pathology and Therapeutics of the Disease of Domestic Animals. 3rd American ed., vol. 2. Alexander Eger, (1926): 446-447.

[5]Farquharson, James: The Use of Sulfonamides in the Treatment of Calf Diphtheria. J.A.V.M.A., *101*, (1942): 785.

[6]Gaiger, S. H., and Davies, G. O.: Veterinary Pathology and Bacteriology. Alexander Eger, (1932): 474-5.

state: "Suppurative hepatitis may arise from emboli conveyed by the portal vein from the digestive tract and by direct extension along the vein in phlebitis. Liver abscesses in cattle are frequently traumatic in origin. Such lesions are large and simple."

Etiology.—During the past few years, since the instigation of extensive studies which the writer has either conducted or coöperated in, numerous theories as to the contributing and actual cause of telangiectasis, so-called sawdust condition and liver abscess have come to our attention. Several of these theories have been investigated and others are being or will be investigated in the future.

One popular theory is that the feeding of soybean-oil meal is a cause. We have not been able to substantiate this theory. In fact, if one based his judgment on the results of a test completed Aug. 2, 1942, by the University of Illinois, where 3 lots of 10 steers each were fed for 100 days on 33.33, 20.0, and 12.5 per cent, respectively, of 43.0 per cent protein soybean-oil meal, with only 1 liver condemned for abscess, and that in the lot being fed the lower level of soybean-oil meal, one could postulate that possibly this material was a fairly good preventive of these hepatic disturbances. This, however, is not justified.

These theories are too numerous for detailed discussion in this paper, but they cover just about every foodstuff used in the fattening of cattle, vitamin deficiencies, mineral deficiencies, different possibilities as to modes and entrance of infection, etc. Beet pulp, wet and dry, has come in for considerable suspicion as indicated by theories advanced. One study conducted in the Middlewest covered several thousand head of cattle slaughtered, including numerous 4H Club calves, where the lots and/or individuals were traced back to the feeder or to the rancher. Some of these lots of cattle showed extensive liver abscess formation, telangiectasis, and sawdust condition; other lots were well marked and slightly affected; and still others showed no involvement. There was just about as high a percentage which received beet pulp, in one of its various forms, in the all clear lots as in those showing well marked and heavy involvement. To make a long story short regarding our findings, a relationship between any of the feeds ordinarily fed and these hepatic disturbances has not been found, and no particular feed thus far has been indicted nor do the data warrant suspicion of any.

In these studies, we investigated the possibility that hogs following cattle in the feedlot are a factor, particularly in liver abscess. Also, we investigated the possibility that cattle which had sore feet, split and infected between the cloven hoofs, at some time during the feeding period had some bearing. Neither of these causes, namely, hogs following cattle or sore feet, can be incriminated by our data.

We have one observation worthy of note: that the apparent trend in the incidence of all three of these conditions, namely, telangiectasis, sawdust condition, and simple liver abscess, is greater in exceptionally well-fed steers, which have been on highly concentrated fattening ration for extended periods of time. This would lead one to postulate that possibly the livers, or at least certain cells, become overworked in this long feeding period, become deranged, and these pathological conditions develop. Additional study is necessary to substantiate this suspicion.

FOREIGN BODY HEPATITIS

One fairly definite finding in our studies has been the incrimination of foreign objects, taken into the cattle's stomachs with their food, which puncture the stomach wall and damage the liver tissue, inoculating it with pyogenic bacteria with a resultant abscess at the point of injury.

The stomachs and stomach contents of 2,042 good to prime, long-fed steers were carefully washed out and examined after the liver had been found to be abscessed on postmortem inspection. The results are tabulated as follows:

The number found containing no foreign objects was 1,372 (67.2%).

The number containing foreign objects was 670 (32.8%).

The number containing foreign objects which were loose in the contents, unattached to the

wall, was 283 (42.2% of the number containing foreign objects).

The number containing foreign objects attached to the wall but not perforating the stomach wall was 199 (29.7% of the total number containing foreign objects).

The number containing foreign objects which had perforated the wall of the stomach with resultant liver damage at the point of perforation with an abscess formed was 188 (28.1% of the stomachs containing foreign objects).

The percentage of livers in this study affected with abscesses which were undoubtedly caused by foreign objects perforating the wall of the stomach was 9.2 per cent of the total examined.

The stomachs and contents of 2,042 retired dairy cows, the livers of which had been found to have abscesses on postmortem inspection, were likewise carefully washed out and inspected. This resulted in the following tabulation:

The number containing no foreign objects was 345 (16.9%).

The number containing foreign objects was 1,697 (83.1%).

The number with foreign objects unattached was 620 (36.5% of those containing foreign objects).

The number containing foreign objects which were attached to the wall of the stomach but not perforating it was 956 (56.4% of those stomachs containing foreign objects).

The number showing foreign objects perforating the wall of the stomach with liver damage and abscess formation was 121 (7.1% of those stomachs containing foreign objects).

In this study, the number of liver abscesses undoubtedly due to damage by foreign objects perforating the wall was 5.9 per cent of the total number examined.

It was interesting to note that, although the old cows showed a much higher incidence of foreign objects in their stomachs, the percentage of livers condemned due to perforation with liver damage and abscess formation was considerably less than in the well-fed steers. However we believe that this is explained, in part, by the type of foreign objects found. For instance in the steers, the majority of foreign objects were varying lengths of cut up baling wire, nails, staples, and other metallic objects. The retired dairy cows, of course, contained some of these objects, but there was a much larger percentage of other metallic objects not having sharp points, as well as pieces of bone, sticks of wood, stones, rubber material, etc.

Symptoms.—Cattle severely affected with foreign objects damaging the liver showed symptoms not unlike those seen in cattle suffering from foreign objects damaging the pericardium or heart. Many of these animals showed no clinical symptoms at the time they were presented for slaughter. This perhaps was because the condition had become chronic, the acute symptoms having long since subsided. However, there is one point it is well to bear in mind in making a differential diagnosis between traumatic pericarditis and this type of traumatic injury to the liver, namely, that of slight to extensive icterus in the latter condition. It has also been pointed out, by some observers, that in traumatic hepatitis the animals are inclined to stand with an arched back.

Treatment.—In these cases, treatment is unsatisfactory when they are affected severely enough to develop noticeable symptoms. If operated upon surgically, the risk is too great, and it is unlikely that any medicinal treatment would be beneficial.

Again, the logical treatment is the prevention of traumatic hepatitis by keeping all small metal objects, such as nails, staples, etc., out of the feed supply and by preventing wire from going through hay shredders and grinders in the preparation of feed. This includes magnetic separation of metal foreign objects from the grain and other parts of the feed. In fact, common sense and humanitarian handling are all that is necessary.

Economic Losses to Farmers.—Undoubtedly the economic losses mentioned above relative to the condemnation of beef livers as meat food and for the manufacture of pharmaceuticals are small and insignificant compared with the losses being suffered by the cattle producer and feeder.

When one considers that the liver is one of the main accessory organs of digestion and that any one of these conditions deranges its normal functioning, particularly the abscesses in any form, one realizes that

an affected animal cannot grow, develop, mature, and fatten in an efficient manner. In our own experience, we have followed numerous lots of cattle through the feeding to fatten operation and have had the opportunity to observe individual animals while they were in the feedlot. Occasionally, one or several would become sick and exhibit symptoms such as we have described for various types of abscesses. We have seen them shrink in weight and general condition and have followed them through the postmortem inspection to confirm our tentative antemortem diagnosis. From these experiences, we have learned that hepatic disturbances, particularly abscesses, are big economic factors in livestock production,

The rules and regulations of the Meat Inspection Division of the United States Bureau of Animal Industry provide for the disposition of livers affected with abscess as follows, in regulation number 11, section 9, which we quote in part:

> Any organ or part of a carcass which is badly bruised or which is affected by a tumor, an abscess, or a suppurating sore, shall be condemned. Likewise, if these abscesses are multiple and metastasis has taken place and there is evidence of their having spread to other parts of the body, such condition constituting pyemia, then the entire carcass is condemned.

DISTOMIASIS

As we have brought out in previous paragraphs dealing with the economics of bovine hepatic disturbances, distomiasis accounted for 1.24 per cent of liver condemnation in cattle slaughtered under federal inspection during the past seven years. In the United States, there are two kinds of Distoma found infesting the liver of cattle, namely, *Fasciola hepatica*, known as the common liver fluke, and *Fascioloides magna*, which is usually referred to as the large liver fluke. The former, *F. hepatica*, is found in the liver, bile ducts, and gall bladder. The large liver fluke, *Fascioloides magna*, is found in the tissues of the liver, commonly lying in cysts, which, in addition to the flukes, usually contain a quantity of dark colored fluid and débris. This fluke, like the common liver fluke, is a flattened, leaf-like, brown worm. It may attain a length of 7 cm. The anterior or front sucker is not carried on a distinct cone, but in other respects the large liver fluke resembles an overgrown species of the common liver fluke.

As we have pointed out in our discussion of other of the bovine hepatic disturbances, because the liver is one of the most essential accessory organs of digestion, flukes derange normal function, and the animal's well being and general health are adversely affected. This disturbance of digestion is quite marked when feeding results are reviewed on infested cattle. The gain per head per day is usually about half that procured in comparable cattle which are not infested. The cost of gain per cwt. and the feed required to produce 100 lb. of gain are correspondingly adversely affected. By this same token, the finish and quality of the cattle when they are finally ready for slaughter is disappointing. Infestation by this parasite lowers the resistance of infested animals and predisposes to other infestations and infections.

SUMMARY

1) The economics of bovine hepatic disturbances as discussed in this paper, namely, telangiectasis, so-called sawdust condition, abscesses, and distomiasis, have increased in importance during the past few years because of the decided increase in monetary value resulting from a greater demand for liver in the diet and for the production of pharmaceutical extracts.

2) Telangiectasis and sawdust condition have shown a rather constant increase in incidence during the past seven years. The cause for this increase is obscure.

3) Livers condemned for abscess have remained significantly constant in number during the same period of time, and still account for most of this economic loss. While the causes of some liver abscesses are known and pointed out, namely, those caused by necrophorus infection and those caused by liver damage through foreign objects, there are a large percentage the etiology of which is still to be determind.

4) No one particular feedstuff has so far

been shown, in our investigations, to be the direct etiological factor in telangiectasis, sawdust condition, or abscesses.

5) Data collected indicate that cattle held on a full feed of a highly concentrated ration of fattening feeds for long periods show an increase in incidence of telangiectasis, sawdust condition, and abscesses. This observation is only indicative and requires additional investigation for conclusive proof.

6) The incidence of abscesses in bovine livers has not been increased, according to our data, by running hogs with the cattle or in lots in which some of the cattle were affected with sore feet during the feeding period.

7) Beef liver is an excellent source of hight biological quality protein and various vitamins, and is valuable for its antianemic factors. It is also an indispensable accessory organ of digestion and normal metabolism.

8) Nothing new is presented regarding distomiasis. A review of the facts regarding this infestation is given, together with information relative to the effect on cattle in the various stages of development, particularly in the feedlot for fattening.

Polydactyl Soliped

The interest in this abstract by our Dutch translator, Dr. Chas. Haasjes, is not only its geographic source—the Dutch East Indies, Japanese dominated islands of the south seas—but the living proof that the Equidae of prehistoric eras were solipeds. The present report came from Dr. L. Harmsen, district veterinarian, District Kediri, Java, who observed this abnormal condition in a native horse. "My examination," says the author of the original article, "showed that the extra toe on each leg articulated with the distal end of abnormally large, medial, small metacarpal and metatarsal bones."

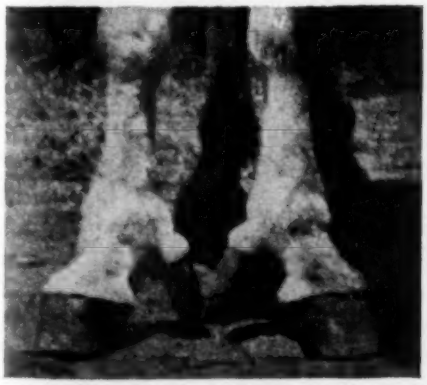

Fig. 1—The two fore limbs.

Fig. 2—The off hind limb.

The horse was used regularly in a two-wheeled cart and no wounds caused by interfering were present. The horse walked and trotted high and wide. Similar cases, affecting one leg, have been described in the literature.

We publish this for its academic value and as a token assuring our colleagues of the Dutch East Indies that they are not forgotten.

In the United States and Alaska there are 17,000,000 acres of wildlife refuges and sanctuaries including 4,000,000 acres for aquatic fowls. Although the conservation of wildlife got a late start in the United States, the effort is now outstanding.

In 1938, Congress passed a law prohibiting the Army from selling disabled horses and mules and directing that such animals be turned out to pasture for life or left in the hands of humane organizations.

Normotension and Hypertension in the Dog

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Normotension

Definitions.—Blood pressure, of course, means the pressure which the blood exerts on the walls of the containing blood vessels. Although there are arterial, capillary, and venous blood pressures corresponding to these three portions of the systemic vascular tree, the term, blood pressure, when unqualified, refers to arterial blood pressure.

Two levels of arterial blood pressure are commonly recognized and measured, *viz.:* systolic blood pressure and diastolic blood pressure. By systolic pressure is meant the highest pressure attained in a given artery during ventricular systole or contraction. Diastolic pressure refers to the lowest pressure in the artery during ventricular diastole or relaxation. The so-called mean blood pressure is ordinarily taken to be the arithmetical mean or average of the systolic and diastolic pressures.

Normotension (normal blood pressure) is maintained by the cardiac output, the peripheral resistance to the flow of blood through the vascular tree, the blood volume, the viscosity of the blood, and the elasticity of the arteries, the first two factors being more important than the other three.

Sphygmomanometry (blood pressure measurement).—In general, methods of measuring blood pressure are classified as direct and indirect. The direct methods involve the insertion into the artery of a cannula or needle connected by means of rubber tubing containing an anticoagulant solution with a pressure recording device, *viz.:* a mercury, aneroid, or membrane manometer. The membrane manometer records both systolic and diastolic pressures, whereas the mercury and aneroid manometers, due to inertia, record only mean blood pressure. The direct methods have been employed largely in blood pressure studies on experimental animals, particularly dogs, and to a limited extent in experimental blood pressure studies on man. The direct methods are not used in routine medical practice.

The indirect methods involve the principle of balancing air pressure in a flat rubber bag, or so-called cuff, against the pressure of the blood in the artery and then determining the former with a mercury or aneroid manometer by means of auscultation or palpation over the artery. The indirect ausculatory method is now routine for measuring blood pressure in ordinary medical practice, and is used to a certain extent on dogs and other animals in experimental laboratories.

Sphygmomanometry in veterinary medicine today occupies the same status that it had in clinical medical practice forty years ago. At the turn of the century, physicians estimated blood pressure by palpation of the pulse and attempted to deduce the presence of high blood pressure from left ventricular hypertrophy in the absence of valvular lesions and from pulse tracings. Even then, however, the modern indirect auscultatory method of measuring blood pressure in the human being had been devised but was used only by research workers. Only after the first decade of the present century did the measurement of blood pressure become an integral part of the routine medical examination. Sphygmomanometry in canine medicine is now largely limited to the occasional estimation of blood pressure by palpation of the femoral pulse. And yet, sphygmomanometric methods have recently been devised for the dog and certain other laboratory

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animals which are entirely suited to routine canine practice.

Of the two methods now available to the veterinarian engaged in canine practice, one is a direct procedure. The sphygmomanometer (fig. 1) for this purpose consists of a 10 cc. syringe to which is attached a three-way stopcock. On the end of the stopcock is placed a 20- to 22-gauge needle and from the side arm heavy rubber tubing leads to a spinal glass trap which in turn is connected by rubber tubing to an aneroid manometer. With the exception of the manometer, the system is rendered sterile and up to the lower quarter of the trap is filled with sterile 5 per cent sodium citrate solution from the syringe. The dog should be comfortably relaxed and gently restrained in the supine position. If the animal is unduly apprehensive, sedation with one of the barbiturates may be employed. With the hind leg extended and abducted, the region of the femoral artery below Poupart's ligament is surgically prepared and may be infiltrated with 1 or 2 per cent procain solution. With the femoral pulse as a guide, the needle of the sphygmomanometer is inserted well into the femoral artery toward the groin, taking care not to transfix the artery and avoiding the femoral nerve. When the appearance of blood in the syringe shows that the artery has been entered, the stopcock is turned to connect the artery with the manometer. After one to two minutes for stabilization of the pressure, the midpoint of the oscillations of the manometer is read as the mean blood pressure. The needle is then withdrawn and pressure is applied over the puncture wound for several minutes to prevent the formation of a hematoma. The chief advantage of this direct method is its accuracy. Its disadvantages are the necessity for arterial puncture and the fact that the mean pressure, rather than the systolic and diastolic pressures, is obtained. The first objection is more apparent than real since femoral arterial puncture is not difficult and may be repeated as often as several times daily for weeks or several times weekly for years. The second objection has been overcome in some research laboratories by using a membrane manometer and recording systolic and diastolic pressures optically. This modification, however, is not suitable for ordinary veterinary practice.

The other sphygmomanometric method available for the dog is an indirect auscultatory procedure. The sphygmomanometer for this purpose consists of a folded 7- or 9-cm. pneumatic cuff attached by rubber tubing to a mercury or aneroid manometer and to a hand or pressure bulb fitted with a needle valve. With the dog comfortably relaxed and in the lateral or the supine position, the fore leg is extended and abducted. The cuff is applied to the upper fore leg and a stethoscope is placed over the brachial artery on the anteromedial surface of the elbow. The cuff is inflated by means of the hand bulb so as to obliterate the arterial lumen and arrest completely the flow of blood in the artery. The pressure is then slowly released (2 to 3 mm. Hg. per second) through the needle valve and tapping sounds in rhythm with the heart are heard when the pressure is reduced just enough to permit jets of blood to pass through the artery under and beyond the cuff. The pressure level at which the first sounds appear is taken as the systolic pressure. Later, the systolic reading may be checked by palpation of the pulse. With continued deflation of the cuff, the point at which the sounds become definitely dull and muffled is read as the diastolic pressure. With further deflation, the sounds ordinarily completely disappear. This method of sphygmomanometry in the dog, which is essentially that employed for the human being, has the advantages of being bloodless and of determining both systolic and diastolic pressures. The chief and important disadvantage of the method is that spasticity or hypertonus of the skeletal muscles of the fore leg not infrequently results in readings which are somewhat higher than the true arterial pressures. Less serious objections are the occasional

inability to hear the first sounds due to their faintness and the difficulty in determining the change in the character of the sounds which is indicative of the diastolic level. Chiefly because of its heavier musculature, the hind leg of the dog has proved definitely unsatisfactory for the measurement of blood pressure by this indirect technique.

During the past several years, many research workers have employed the direct method for blood pressure studies on the dog, whereas only a few investigators have used the indirect auscultatory procedure. Unfortunately, adequate comparative studies of these two sphygmomanometric methods on the dog have not been reported thus far. However, the facts now available recommend the direct method as first and the indirect auscultatory method as second choice for incorporation into the procedures comprising the routine examination of the canine patient by the veterinarian. Members of our research staff will be glad to demonstrate either or both of these methods to the veterinary profession at our laboratory.

Values.—As in the human being, considerable differences have been found in the blood pressures of healthy dogs. Thus, the mean femoral artery blood pressures of several hundred normal, resting dogs by the direct method have been found to average 120 mm. Hg., and to range from a minimum of approximately 90 mm. Hg. to a maxium of approximately 150 mm. Hg., with the great majority varying between 110 and 140 mm. Hg. More values must be reported, however, before the extremes of normotension in the dog are definitely established. Readings of the brachial artery pressures of less than 100 normal dogs by the indirect auscultatory method indicate an average of 140 mm. Hg. with a range of 100 to 180 mm. Hg. for the systolic pressure and an average of 90 mm. Hg. with a range of 60 to 120 mm. Hg. for the diastolic pressure. Thus, the blood pressure values for normal dogs are somewhat higher than the averages of 120 mm. Hg. systolic and 80 mm. Hg. diastolic for the brachial artery of man.

Blood pressure variations in man are known to be associated with age, sex, weight, bodily habitus, heredity, nutritional state, climatic environment, emotion, digestion, exercise, posture, pain, and other factors. Undoubtedly, these factors are also important in determining normotensive levels in the dog but with the exception of emotion, carefully controlled studies of the effect of these factors on the blood pressure of the unanesthetized dog are not available. Thus, apprehension or fear may definitely elevate the blood pressure of the normal dog, and not uncommonly, repeated daily blood-pressure determinations on an animal show a decrease of 20 to 30 mm. Hg. or more over a period of several weeks. Occasionally, the emotional factor may temporarily raise the blood pressure of the dog to what are probably definitely abnormal levels. With reliable, practicable methods of blood pressure measurement at their disposal, veterinarians are now in position to amass blood pressure data for the normal dog, inclusive of variations under different physiological conditions, just as physicians have done for the human being. Such data will subsequently aid measurably in the recognition and proper evaluation of abnormal or pathological variations in canine blood pressure.

Hypertension

In Man.—Pathologically, the blood pressure may be persistently below or above the normal range, conditions termed hypotension and hypertension respectively. In the human being, of course, hypertension is far more frequent. It is generally considered to be present when the systolic pressure is above 150 mm. Hg. or the diastolic pressure is more than 95 mm. Hg. Hypertension is really a sign of disease just as is an elevated temperature or fever, and like fever, high blood pressure is produced by different diseased conditions. This fact forms the basis for

one of the more acceptable classifications of hypertension in man, *viz.:*

1) Renal hypertension (due to glomerulonephritis, pyelonephritis, prostatic obstruction, polycystic kidneys, renal tumors, or other renal abnormalities).

2) Cardiovascular hypertension (due to coarctation of the aorta, periarteritis nodosa, or heart block).

3) Endocrine hypertension (due to basophilic adenoma of the anterior pituitary, adrenal medullary tumors, adrenal cortical tumors, or hyperthyroidism).

4) Central nervous system hypertension (due to poliomyelitis, ascending paralysis, or increased intracranial pressure).

5) Esential hypertension (etiology unknown).

Essential hypertension is by far the most common form of high blood pressure in man. Indeed, more than 2 million people in the United States have essential hypertension and the condition is responsible for 150,000 deaths yearly or 25 per cent of all deaths in persons more than 50 years of age. The five factors responsible for the maintenance of blood pressure have been thoroughly studied in patients with essential hypertension and the results show that as a rule, the cardiac output, the blood volume, the blood viscosity, and the elasticity of the arteries are within normal limits. The peripheral resistance, however, is invariably increased due largely to generalized narrowing of the smallest arteries or arterioles, thereby accounting for the high blood pressure. The arteriolar narrowing in turn results primarily from vasoconstriction or increased tonus of the smooth muscle of the arterioles and secondarily from sclerotic changes in their walls. The direct exciting cause, or causes, of the generalized vasoconstriction in essential hypertension are still unknown, although in recent years much progress has been made in the elucidation of the basic pathogenetic factors involved. While the exact cause or causes are still obscure, a number of factors predisposing to the development of essential hypertension are known. Thus, the condition is most likely to appear after the age of forty; it occurs more frequently in some families than others; it is more likely to develop in stockily built and obese individuals than in slightly built, thin persons; and it is more common in individuals of the high nervous tension type.

In its earliest phases, essential hypertension may be present without symptoms and with the elevated blood pressure as the only sign. Somewhat later, the more common complaints are headache, vertigo, nervousness, fatigue, palpitation, and dyspnea on exertion or after eating. The chief complications of essential hypertension are cardiac failure, cerebral hemorrhage, and renal failure.

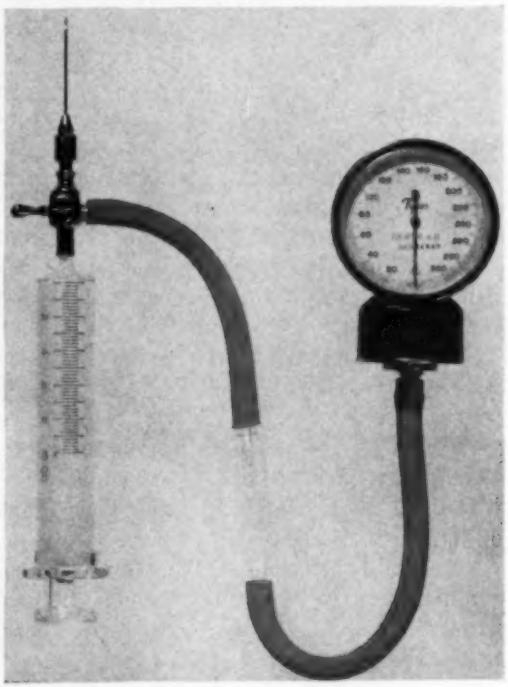

Fig. 1—Sphygmomanometer consisting of a 10 cc. syringe to which is attached a 3-way stopcock, on the end of which is placed a 20- to 22-gauge needle. From the side arm, heavy rubber tubing leads to a spinal glass trap which is connected by rubber tubing to an aneroid manometer.

The treatment of hypertension in man involves the removal of the cause where this is possible; *e.g.*, excision of an adrenal medullary tumor or nephrectomy in certain instances of unilateral renal abnormality. The treatment of essential hypertension, however, is at present

fundamentally symptomatic and palliative rather than curative in character. It includes psychotherapy, mental and physical rest, moderation in diet and habits, and the use of vasodilator and sedative drugs. Some authorities recommend bilateral splanchnicotomy (section of the splanchnic nerves) or complete sympathectomy (removal of the sympathetic division of the autonomic nervous system) but probably less than 5 per cent of patients subjected to these surgical procedures obtain what is tantamount to a cure. Consequently, these operations will not become practicable for the treatment of essential hypertension unless those patients belonging to this group of 5 per cent (who probably constitute a special type or species within the genus of essential hypertension) can be selected before operation.

In the Dog.—Most probably, hypertension also occurs spontaneously in the dog. However, as already indicated, the limits of normotension in this species are not yet definitely determined, and as would be surmised, data relative to spontaneous hypertension in the dog are few. Thus, there are several reports each of one or two hypertensive dogs, and we have found one animal with a low grade hypertension evidenced by a mean femoral artery pressure varying from 150 to 180 mm. Hg., out of approximately 200 comparatively young laboratory dogs. However, glomerulonephritis, pyelonephritis, prostatic obstruction, and renal tumors are well-known conditions in the dog and must in some cases be associated with hypertension in this species. Certain of the complaints of the human patient with essential hypertension, *viz.:* Vertigo, nervousness, fatigue and dyspnea on exertion or after eating, are observed in canine patients and in certain instances may be due to hypertension. Cardiac failure, cerebral hemorhage, and renal failure are likewise well-known conditions in the dog and most probably, as in man, sometimes result from long standing hypertension. Only the routine employment of sphygmomanometry in canine practice will enable the diagnosis of hypertension in the dog and the determination of its incidence, predisposing factors, causes, types, symptoms and signs, complications, and responsiveness to therapy.

Primarily to obtain an improved understanding and more satisfactory treatment of essential hypertension in the human being high blood pressure has been produced experimentally in the dog and other laboratory animals by various methods. Only two of these, *viz.:* Constriction of the renal arteries and the less frequently employed production of an aseptic perinephritis give rise to a high grade, persistent, and otherwise satisfactory hypertension. So-called experimental renal hypertension in the dog due to constriction of the renal arteries has been shown to resemble in many respects essential hypertension in man. There is also excellent evidence that this experimental condition is not dependent upon the innervation of the blood vessels but is due to the release from the kidneys of a pressor substance which produces a generalized arteriolar constriction. Whether a similar mechanism is operative in essential hypertension in the human being remains to be proved, although there is some evidence that such is the case. While studies of experimental renal hypertension in the dog have been invaluable to the problems of essential hypertension in man, similar studies of spontaneous hypertension in the dog, should it be found to occur, would probably be even more important.

The use of vasodilator and sedative drugs, splanchnicotomy, and sympathectomy in the treatment of experimental renal hypertension in the dog has not yielded encouraging results. However, certain renal extracts have recently been found by others and ourselves to reduce the blood pressures of dogs with experimental renal hypertension to normal levels. Our ex-extracts have proved to be without evidences of local or general toxicity. We have also treated the one spontaneously hypertensive dog previously mentioned with one of our renal extracts and have obtained

good results. Our extracts are given intramuscularly, usually in a dosage of 1 cc. per kg. of body weight (equivalent to 2 Gm. of fresh porcine renal cortex) at daily intervals, although the injections may undoubtedly be given less frequently when normal blood pressure levels are reached after three to four months of therapy. The extract which we have used most is prepared by extracting dried minced hog kidney cortex (dehydrated and defatted with acetone and ether) with 0.5 per cent sodium bicarbonate in physiological salt solution and removing much of the associated protein by isoelectric precipitation.

If the routine employment of sphygmomanometry in canine practice uncovers patients, particularly older dogs, with high blood pressure similar in type to essential hypertension in the human being, antihypertensive renal extract therapy is available on an experimental basis for such animals. Our research staff will accept suitable hypertensive dogs for treatment in coöperation with the veterinarian or will furnish renal extract in return for adequate blood pressure records. We anticipate that this type of therapy will effect symptomatic improvement, prolong the life span, and prevent premature death from cardiac failure, cerebral hemorrhage, or renal failure in spontaneously, as well as experimentally hypertensive dogs and ultimately in hypertensive human beings.

CONCLUSIONS

1) Sphygmomanometric methods suitable for inclusion as an integral part of the routine examination of the canine patient are now available to the veterinarian.

2) Routine sphygmomanometry in canine practice will establish the limits of normotension, as well as its variations under different physiological conditions, in the dog.

3) Routine sphygmomanometry will also enable the diagnosis of hypertension in the dog and the determination of its incidence, predisposing factors, causes, types, symptoms and signs, complications, and responsiveness to therapy.

4) Studies of experimental hypertension in the dog produced by constriction of the renal arteries are yielding important results relative to the pathogenesis and therapy of hypertension in the dog and human.

5) An antihypertensive renal extract, which has proved remarkably effective in the treatment of experimental renal hypertension in the dog, is now available on an experimental basis to veterinarians for the therapy of spontaneous hypertension in this species.

Britain Can Feed Herself

Britain Can Feed Herself is the title of a book by Col. George P. Pollitt, D.S.O., M.Sc., Ph.D., reviewed in the *Veterinary Record*. The author proposes to feed 47,700,000 people on 34,755,000 acres of land by plowing up every arable acre and doubling the number of livestock. But, says the reviewer, "When we consider the enormous losses caused by contagious abortion, sterility, tuberculosis, Johne's disease, foot-and-mouth disease, and a hundred-and-one insidious infections known and unknown to science, it may be doubted whether our cattle population can be increased from eight to eighteen million without provision for an adequate veterinary service."

The above depicts the comparably unwise program of swelling animal production in the United States with the difference that Sir Claude instead of Sir George is the spokesman. Multiplying the number of animals without providing a corresponding increase in disease supervision is apt to be the undoing of high food production in both Britain and America.

Another War Bond bought with money you'll never miss helps our fighters in far-away battlefields.

Progress Report on Idiopathic Hemoglobinemia in Cattle

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HEMOGLOBINEMIA is an important symptom of a number of diseases of man and domesticated animals. Several of these diseases have been reported in different parts of the United States and Canada.

Recently, a number of cases of a disease in cattle, particularly calves, have been brought to the Department of Veterinary Medicine, Oklahoma A. & M. College. The most consistent and readily recognized symptom of this disease is a severe hemoglobinuria. However, the symptoms and lesions were in many respects new to the staff members, and because of the heavy losses in certain herds, it was deemed advisable to attempt to ascertain the cause.

The available literature was carefully examined, but little helpful information was found concerning diseases of cattle which resembled this condition.

As early as 1914, Nevada Agricultural Experiment Station[1] workers described a disease occurring extensively in that state, in which hemoglobinuria was a cardinal symptom. Later, Records and Vawter[4] at the same station described the disease under the name *ictero-hemoglobinuria.* In 1928, these workers[6] published the results of further investigations of this disease in a station bulletin under the title of "Red Water Disease of Cattle" (Bacillary Hemoglobinuria). The etiological agent was established as a spore-forming anaërobe to which the name *Clostridium hemolyticum bovis* was given. This disease is sharply restricted as to geographical distribution.

In 1916, Meyers[2] reported a disease of cattle in California under the title, "Studies to Diagnose a Fatal Disease of Cattle in the Mountainous Regions of California." Hemoglobinuria was a prominent symptom of this disease. The cause of the disease was not established.

A postparturient hemoglobinuria has been described by Farquharson and Smith[8] in Colorado and by Madsen and Nielson[10] in Utah.

Last year Schofield[11] reported a disease in Ontario, in a paper entitled, "Nonspecific Hemoglobinuria and Acute Pulmonary Emphysema of Cattle as Essential Enterotoxemias." This worker concluded that his cases were probably of nutritional origin.

Before presenting the clinical picture of the disease recently brought to the attention of the Veterinary Department, a brief description of some of the similar diseases that have been reported is advisable.

BACILLARY HEMOGLOBINURIA[6]

Records and Vawter in their classical presentation of the subject, "Red Water Disease of Cattle," have definitely shown that this disease in Nevada is caused by an organism which they called *Cl. hemolyticum bovis.* It is a large, gram-negative, spore-forming organism. The ends are rounded in case of a single bacillus. Capsules were not present. Endospores were present and situated either terminally or subterminally. It grows best in peptic digest broth plus raw rabbit liver, sealed with paraffin under anaërobic conditions, and at 37 C. produces a toxin which is fatal to laboratory animals.

Cattle inoculated with 40 cc. of a culture of this organism, intramuscularly, developed the disease and died. The organism was again isolated from the vital organs of the inoculated animals.

The onset of this disease is sudden. The animal stands apart from the herd, its eyes sunken and bloodshot; its temperature is high, 106 F., but falls to subnormal before death. The bowels move frequently and in small amounts; later the feces becomes bloody. The urine is at first faintly pink, later turning to port wine color. The dura-

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From the Department of Veterinary Medicine, Oklahoma A & M College.

tion is from a few hours to several days. The death rate is high, reaching 100 per cent.

The postmortem examination shows numerous hemorrhages, and the body cavities contain bloody fluid. The spleen is dark but not enlarged; the kidneys are speckled with hemorrhages. The most striking lesion in this disease is in the liver. This lesion varies in size from a few inches to one-fourth of the liver. This is the focus of the organisms.

PARTURIENT HEMOGLOBINEMIA OF DAIRY COWS

Madsen and Nielson, Department of Animal Pathology, Logan, Utah, report, "a disease of high producing dairy cows occurring 2 or 3 weeks following calving and characterized by anemia, hemoglobinuria, and general weakness, occurring in the intermountain areas, affecting cows giving birth to the third to the sixth calf." It appears to be more persistent on certain farms and has a tendency to recur in the same animal.

These workers were unable to demonstrate any bacterial toxin, enterotoxin, or protozoal type of organism as the cause of this disease. In their experience, it occurred in cattle generally fed on sugar beet products. In the animals they studied, the inorganic phosphorus was extremely low, 0.40 mg. per 100 cc. of blood. As will be shown, this is not in accord with our findings in the disease studied in our laboratory.

POSTPARTURIENT HEMOGLOBINURIA OF CATTLE[8]

As reported by Farquharson and Smith, Colorado State College, and from a personal communication from D. A. Sanders, University of Florida, the condition called postparturient hemoglobinuria of cattle is rather widespread. It apparently is not the same disease reported by Records and Vawter of Nevada, because the latter reported that they isolated the *Cl. hemolyticus bovis*, and that the disease was confined to the beef herds. On the other hand, the Florida trouble is confined mainly to adult and well-nourished animals, and occurs in the winter and spring. It also occurs in animals in heavy milk flow, at about four weeks after calving. Hemoglobinuria is the first symptom noticed, then weakness, loss of appetite, muscular incöordination, and paleness of the mucous membranes and of the skin of the teats and udder. The temperature is elevated from 100 to 104 F. The loss of flesh is rapid. The animal becomes so weak from loss of blood that it is unable to stand, and death follows.

The course of this disease is rapid. Recoveries do occur under proper treatment, but recovered cases are more susceptible to future attacks.

According to the authors, the urine of these cows, as determined by laboratory tests, contains no blood cells, but it does contain hemoglobin. It is alkaline in reaction and has a low specific gravity. Albumin is present. Sugar is absent.

They were unable to transmit this condition by injecting blood from affected animals into normal cattle. As a treatment, they suggest good care, warm quarters, fresh water, and alfalfa hay, as well as blood transfusions, glucose intravenously, calcium salts, and adrenalin chloride in 10 cc. doses of a 1 : 1000 solution.

PASTORAL HEMOGLOBINURIA OF CATTLE[13]

According to a report from Drenthe, Holland, cattle grazing on certain ground suffer from hemoglobinuria during the whole summer, especially when grass growth is luxuriant. The blood picture is characterized by the presence of many inclusion bodies in the red cells, and by the production of intracellular methemoglobin apparently caused by some toxic agent in the red cells, not in the plasma. Hemolytic influences not associated with inclusion bodies were excluded as the cause of the disease.

NONSPECIFIC HEMOGLOBINURIA[11]

Frank W. Schofield of Guelph, Ont., in describing nonspecific hemoglobinuria, has attempted to show that the condition with which he worked is essentially an enterotoxemia because of a fetid diarrhea which preceeds a change in the color of the urine. Later, this diarrhea is followed by constipation and a paralysis of the intestines.

He further shows that in the cases under his observation, the blood plasma was low in inorganic phosphorus, and that it may be as low as 0.5 mg. per cent.

Further attempts were made to prove that the toxin produced by *Clostridium welchii* in the intestinal tract upon being absorbed caused the destruction of the red blood cells in the circulation. In the cases studied, the liver showed a very severe damage, having lesions characteristic of a toxic necrosis. This was also true of the kidney tissue. Attempts were made to treat some cases with Clostridium antitoxin concentrated globulins, in 10,000-unit doses. The results of this work were not conclusive.

Schofield was successful in reproducing clinical hemoglobinuria in 2 out of 10 animals fed on an exclusive diet of rape for periods of time varying from two to four weeks. He found that there is considerable difficulty involved in reproducing the disease when normal animals are used in the experiment. The feeding of abnormal amounts of foods known to be conducive to the development of hemoglobinuria is not enough to produce the disease. He also states that the animals must be low in phosphorus, and a hemolysin-producing organism must be present.

OCCURRENCES

Sporadic cases of a disease similar to those studied recently have been observed in Oklahoma for a number of years. Previously, because of the few losses due to the disease, no extensive work was done. According to cattlemen, a few cases occurred in Oklahoma in July, 1941. Following the heavy rains which occurred in this state in October, reports were received from veterinarians and livestock men from all parts of the state, particularly where a large number of cattle are raised. During the first week in December, reports from nine different ranches were received. Then, no more cases were reported for about two weeks, and the condition was thought to have abated. After this interval, calls were received from many sections of the state to the effect that the cattle owners were experiencing losses from red water. In all, about 27 cases, involving several thousand, both old and young animals, with apparently no recoveries after hemoglobinuria had developed have been reported.

To our knowledge, there have been no spontaneous recoveries after symptoms were noted.

Records reports the disease he studied as occurring most frequently in swampy, poorly drained areas and excessively irrigated pastures. These conditions do not prevail in Oklahoma, although this was an unusually wet year which resulted in many flooded areas. However, this condition has not been constant on the farms where the disease has occurred.

Symptoms.—The disease studied by us is characterized by a sudden onset, rapid course, and fatal termination. At first, the temperature ranges from 103.5 to 105 F. The animal is not depressed, however, and the appetite appears normal until a few hours before death. The passage of red-stained urine is always the first, and in our opinion, the cardinal symptom. In male calves, the hair around the prepuce is tinted red, and if the hair on the legs is white, it is stained by red urine. Urination does not appear to be painful, but it is frequent. The facial expression is one of distress, the eyes are glassy, usually sunken, and the conjunctiva is hemorrhagic and icteric. There is no struggling just before death. The animals appear to collapse in a coma.

Course and Mortality.—The course is acute, lasting for a few hours in calves to three or four days in older animals. The death rate has been 100 per cent in affected animals. However, only 5 to 35 per cent of the animals in a herd become affected.

ANIMALS AFFECTED

To date, only the beef herds have been affected. There have been no reports of deaths occurring in horses, or in sheep and goats.

Cases were observed in one herd in which only the young calves from 3 weeks to 3 months old and still nursing were affected. In this particular herd, only male calves died. The females running in the same pasture with their mothers did not develop

the disease. In this particular case, 24 calves out of a herd of 77 died in 13 days, while just across a line fence no losses occurred in either the male or female calves. The mothers of the calves from both herds were being fed out of a trench silo filled with cane silage. The cane ran 14 tons to the acre. They drank from a common tank, and were fed out of the same bunks.

In another herd, only the female calves died, and these were 1 year, or more, of age.

On another farm, cows 5 to 6 years of age, and raised on this ranch, died. These cows were nursing young calves at the time they developed the disease. The calves failed to develop the disease and have remained healthy.

On another ranch, only bull calves 1 year of age or older developed the disease and died.

Apparently age, breed, sex, condition, or feed are not etiologic factors.

TABLE 1.—Blood Calcium and Phosphorus Determinations.

	Serum Calcium	Total Inorganic Acid Soluble Phosphorus	Total Plasma Phosphorus	Total Phosphorus of Whole Blood
Normal Jour. of Bio. Chem. 97,511	11 mg. per 100 cc.	9.43 mg. per 100 cc.	11.43 mg. per 100 cc.	19.35 mg. per 100 cc.
Pfaris Case—Bull	10.1	9.01	11.3	25.
Koll Case—Heifer	4.9	7.3	10.	20.8
Doughty Case—Cow SH	6.4	4.	8.	14.
Alexander Case—Steer	11.7	6.97	16.6	20.6
Gray Case—Live Cow	6.2	7.4	7.9	28.8
Gray Case—Dead Cow	13.3	17.4	10.9	40.8
Control Holstein Orr Case—No Red Urine	6.9	5.1	18.9	29.0

Postmortem Lesions

The postmortem lesions are not particularly marked, but are striking. The heart may be petechiated. The lungs are usually reddish-yellow; the spleen is dark, congested, and hemorrhagic on the serous surface. On cut section, the kidneys show considerable edema in the hilus. In all of our cases, there were no microscopic changes in the livers, although the gall bladders were filled with a thick, heavy, granular bile. Around the gall bladder and along the bile duct, there was considerable edema. This lesion was quite constant. The abomasum and intestines showed a slight catarrhal inflammation. The bladder contained colored urine, but the mucous membrane of the bladder was not inflamed.

Histopathology.—The splenic pulp contains many large macrophages with swollen vacuolated cytoplasm. There is an accumulation of monocytes which appear to be actively engaged in phagocytosis of the erythrocytes. The kidneys show an acute and marked degeneration, and disintegration of the tubular epithelium. The tubules contain leucocytes. A few foci of interstitial round cell infiltration are present.

Blood.—There is a rapid destruction of the red blood cells when within the blood vascular system. This results in free hemoglobin which is filtered out by the kidneys, resulting in the red- to purple-colored urine. The red cells, when examined under the microscope, show considerable stippling and there appears to be some spherical bodies in some of them. These may be inclusion bodies. The hemoglobin varies from 20 to 50 per cent, Tallqvist scale.

The red cell count drops from 8 million to 2 million a few hours before death. The blood sedimentation rate is very slow. George W. Stiles of Denver, an authority on anaplasmosis, kindly examined several

stained and unstained blood smears prepared from animals acutely ill or dead of the disease, but he found no indications of blood parasites.

Blood Calcium and Phosphorus Determinations.—We were much interested in blood calcium and phosphorus determinations in many of these so-called red water cases. It should be noted in table 1 that there is a wide variation between the two chemicals, but when one compares it with table 2, which is the blood from apparently normal cattle, too much emphasis should not be placed on it as being a causative factor. The work, however, does fit into the entire picture.

TABLE 2.—Analyses of Normal Cattle Blood mg. of Inorganic Calcium and Phosphorus Per 100 cc. of Plasma

Sample No.	Calcium*	Inorganic Acid Sol. Phosphorus**
1	10.75	13.100
4	9.59	8.375
8	9.49	6.850
10	11.91	4.225
14	10.26	13.100
15	10.26	12.725
25	11.91	5.625
37	5.61	4.375
39	10.84	6.150
45	10.84	7.072
54	11.91	6.762
57	10.75	6.550
62	10.94	8.775

*Normal 11 mg./100 cc.
**Normal 8.5 mg./100 cc.

Urine Analysis

The color varies from a bright red in the early hours of the disease to a dark purple color which appears just before death. Tests on urine have all been negative for red blood cells, acetone, sugar, albumin, and casts.

Bacteriology.—Rabbits have been inoculated with blood and urine obtained from sick cows and also cows dead of the disease. After holding these inoculated animals for 30 days, they have been found to remain perfectly healthy. Guinea pigs inoculated with blood and urine from animals acutely ill with the disease have remained healthy after 30 days. Guinea pigs and rabbits were inoculated intravenously, subcutaneously, intraperitoneally, and intramuscularly with from 5 to 10 cc. of inoculum.

Cultures, both anaërobic and aërobic, prepared with 5 cc. of blood from sick animals and from animals that had died, and incubated at 37 C. for 7 days, have remained sterile.

Cultures made from material sent to Doctor Records, University of Nevada, and to the Pathological Division, U. S. Bureau of Animal Industry, Washington, D. C., have corroborated our findings in that no pathogenic bacteria were found.

Differential Diagnosis.—Septicemic diseases: anthrax, hemorrhagic septicemia, albuminuria, blackleg, poisoning, such as sodium chlorate; arsenic, alkali, salt, copper sulphate, phenothiazine, nitrate, prussic acid, cotton seed cake, selenium, blood parasitic diseases, anaplasmosis, piroplasmosis, trypanasomiasis.

Animal Inoculations.—Calves, both dairy breeds and beef breeds, have been inoculated intravenously with blood from sick and dead cattle, using as much as 40 cc. All remained normal. We have failed to reproduce the disease by blood inoculations. Temperatures were taken twice daily on these calves, but no rise in temperature was noted.

Hemolysis or Erythrocytolysis[14]

In hemolysis, the essential phenomenon consists of the escape of the hemoglobin from the stroma of the corpuscles into the surrounding fluid. As it is not exactly known in what way the stroma holds the hemoglobin normally, whether purely physically or in part chemically or whether the stroma consists of a spongoplasm, the ultimate processes that permit the escape of the hemoglobin are not finally solved. The agents by which the escape is brought about are well known, for example:

1) *Mechanical.*—Hemoglobin escapes only through injury of the stroma and not by osmotic diffusion. Beckhald believes that the stroma behaves as a protein mesh holding, by adscription, a homogeneous mixture of cholesterol and lecithin. The swelling or precipitation of any of the components of this complex colloidal mixture is capable of loosening the

entire structure and may be brought about by shaking blood with inorganic suspensions, or by unequal alterations in the state of hydration of the liquid mixture and the protein framework by physical means; for example, freezing or heating or by chemical means with the heavy metals.

2) *Hemolysis of Bacteria.*—Both pathogenic and nonpathogenic bacteria produce hemolytic substances that are excreted into the fluids in which they grow. During many infectious diseases, marked hemolysis occurs, especially in those diseases accompanied by septicemia and gas-bacillus infections producing toxins. These toxins may destroy the red blood cells, resulting in hemoglobinuria.

3) *Hemolysis of Vegetable Poisons.*—Many plant poisons are hemolytic, having a direct effect on the erythrocytes. An example of this is saponin, which is closely related to a group of glucosides, strong protoplasmic as well as hemolytic poisons. It is thought that they cause hemolysis and hemoglobinuria indirectly through the changes which they produce in the tissues of the poisoned animal.

4) *Hemolysis in Disease.*—Normally, when a red blood cell becomes damaged, it is more susceptible to phagocytosis and is taken out of the blood by the endothelial cells of the liver, spleen, hemolymphnodes, and bone marrow where it undergoes hemolysis. The pigment portion is split up by the liver, the balance going to form the bile pigments, while the iron is worked over to make new hemoglobin.

In disease, the process is increased, resulting in excessive production of bile pigment which leads to jaundice. When the blood contains at one time more than 0.06 Gm. of free hemoglobin per kilo of body weight, it begins to be excreted by the kidneys.

In acute febrile diseases, the organisms produce lysins which are the products of the organisms, while infections with gas-producing organisms produce hemotoxins. In blood parasitic diseases, the parasites not only destroy the corpuscles in which they live, but they also produce hemolytic substances that are discharged into the plasma. These are known as hemolysins. Hemolytic lipoids produced by intestinal parasites are capable of producing anemia, as in cases of tapeworm, hookworm, and roundworm infections.

POSSIBLE CAUSES

Bovine infectious anemia may yet be found to be the cause of this disease. Has it been transferred from the horse to the cow? Selenium may be another factor.[12] In the Bulletin of the Imperial Institute, No. 38, 1940, an author reports on selenium in soils and crops. Selenium occurs widely distributed in soils as the element, as a replacement of selenium in various minerals, and as selenites and selenates. The forms most available to plants are organic selenium and the selenates. Seleniferous soils are derived from cretaceous shales, and are found in at least nine of the states in the United States. Irrigation schemes in Mexico have led to the appearance of "alkali disease" in stock, the source of the selenium being the river flood water.

Various plants are selenophilic, and the selenium uptake varies enormously with the species of the plant. Thus, some plants are able to concentrate selenium in the top layers of the soil by their selective absorption of selenium and subsequent decay. The toxic effects of selenium compounds have been put to a limited use as insecticides and in the case of various cotton pests (the cotton stainer and the pink bollworm), a form of control has been introduced by the addition of top dressings of selenates to the soil. The selenium is absorbed by the plant and becomes toxic to the pests. The residual soil selenium is readily leached out under tropical poisoning; the cotton seed cannot be fed to stock and thus a serious limitation is imposed upon this means of pest control. What would happen if cotton were treated in this manner and the seeds were made into cottonseed cake for our livestock?

Treatment — Bacillary Type. — At the present time, there is a *Clostridium hemolyticus* bacterin recommended as a preventive to be used at least two weeks before the animals are exposed to the disease.

A hyperimmune serum may be used as a curative treatment. Records and Vawter state that, with serum treatment, about 75 per cent recovered, whereas all of those animals that were not treated died.

Prevention — Bacillary Type. — Feedlot losses on dry hay appear to be almost always due to contaminated drinking water.

Standing water should always be eliminated by draining or fencing. Animals affected should be segregated. If cases develop rapidly in a herd and a positive diagnosis is definitely established, the use of specific antiserum is, of course, indicated. However, because of the similarity in symptoms and lesions to other diseases, a laboratory diagnosis should always be made to substantiate a field diagnosis.

CONCLUSIONS

A condition affecting beef cattle of all ages in Oklahoma, characterized by quick death, hemoglobinemia and, in a majority of cases, hemoglobinuria, is described.

Idiopathic hemoglobinemia of Oklahoma beef cattle is presumably a different entity than the classic "red water" of Records and Vawter, a disease due to *Cl. hemolyticum bovis*, or to the parturient hemoglobinemia of dairy cows due to aphosphorosis, as described by Madsen and Nielsen of the Utah Station. Likewise, the various etiologic and pathological characteristics vary from those described by Schofield, Sanders, and others.

The death rate among several thousand head of Oklahoma beef cattle was approximately 100 per cent of untreated animals. The morbidity ranged from 5 to 35 per cent. All attempts to isolate a causative pathogen, or to reproduce the disease in common laboratory animals and cattle have been negative. To date, we have been unable to correlate any deviations of the blood Ca:P ratio with occurrence of the disease.

The best results in the treatment of sick animals were obtained with intravenous injections of aricyl, a complex arsenic solution.

Further studies aimed at identification of the specific etiologic factor or factors are planned.

ACKNOWLEDGEMENTS

In appreciation for the helpful suggestions and encouragement, the writer wishes to thank C. H. McElroy, H. W. Orr, and E. E. Harnden of the Veterinary Science staff, V. G. Heller of the Chemistry Department, Oklahoma A. & M. College, and A. H. Quin of Des Moines, Iowa.

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Corrigendum

In the April, 1943 issue of the JOURNAL, Clinical Data Section, page 297, the new word *vitamer* was incorrectly spelled as *vitaminer*. Quoting from the article in the January 15 issue of *Science* on which the JOURNAL item was based: "Compounds that act to overcome a given vitamin deficiency (in one or another organism, animal or plant) are vitamers (vitameric), according to nomenclature developed by K. Hickman, Gibson Island Vitamin Conference, July 22, 1942; thus, there are various D vitamers, K vitamers, B-1 (or thiamin) vitamers, niacin vitamers, pantothen vitamers, pyridoxin vitamers, para-aminobenzoic acid vitamers, and as indicated in this paper, various biotin vitamers. Whereas isomers are compounds with a given molecular formula, vitamers are compounds with a given vitamin activity and usually possess different molecular formulas."

White Leghorns require less vitamin B than other known breeds of chickens.—*Science New Letter*..

Trichinosis: As Viewed by Different Interests

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ROUGHLY SPEAKING, it has been only within the last 100 years that such an entity as trichinosis has been known to exist in nature. The parasite causing trichinosis, when first discovered, was found in the flesh of human cadavers. Soon after its original discovery, diligent scientific investigation disclosed that its occurrence in nature was confined to the flesh of meat-eating animals, including man. Further research disclosed its sole mode of transmission to be through the eating of raw or undercooked meat containing live, infective larvae of Trichina.[1]

Pork is the flesh of the only meat-eating domesticated animal, the flesh of which enters the human diet. Pork is, therefore, the only class of domestically produced meat from which man may contract trichinosis. The word "may" has been used advisedly. Man cannot contract trichinosis from eating raw or undercooked pork unless the pork contains the living larvae of Trichina. Therefore, preventing trichinosis in swine is the chief solution for the elimination of trichinosis in man.[2, 3, 4]

In all well organized communities there are specialized agencies that assume the performance of functions for which they are especially fitted. If any one, or a few of these agencies, fail in the performance of their duties the endeavors of those which have performed their tasks may be rendered less effective. The maximum benefit redounds to society in any undertaking only when the functions of all agencies having an interest therein are active and coördinated.

The mere fact that trichinosis is prevalent in such form and obscurity that man may unwittingly become a host to its stealthy invasions should inspire all to put up a solid front against this enemy. Statistical information on the prevalence of Trichina in swine in this country has been published repeatedly as a warning to the public that the consumption of raw or inadequately cooked pork may result in serious, if not fatal, consequences. The Federal Bureau of Animal Industry originated practically all the constructive measures designed to protect the American public from the danger of acquiring trichinosis.

The United States Public Health Service, in its usual, efficient manner, has heralded from time to time the truth about human trichinosis. It has announced the incidence of human trichinosis in various localities as ascertained by numerous necropsies on human cadavers where death had occurred from a great variety of causes, none of which were related to trichinosis. The public has been repeatedly informed of how it may escape contracting trichinosis. There is considerable evidence which indicates that the incidence of human trichinosis in any locality is closely correlated with the incidence of swine trichinosis in that same locality.[4]

Thus, of all the many agencies that possess power to be of service to society in its relation to trichinosis, we find two that have rendered especially worthwhile service; namely, the United States Bureau of Animal Industry and the United States Public Health Service. These two agencies have rendered outstanding services: first, through informing the public concerning

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Presented before the Section on Sanitary Science and Food Hygiene at the seventy-ninth annual meeting, Chicago, Ill., Aug. 24-27, 1943.

Consulting Veterinarian, John Morrell & Company, Ottumwa, Iowa.

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[4]Kerr, K. B., Jacobs, Leon, and Cuvillier, Eugenia: Studies on Trichinosis: XIII. The Incidence of Human Infection with Trichinae as Indicated by Postmortem Examination of 3,000 Diaphragms from Washington, D. C., and Five Eastern Seaboard Cities. Reprint 2265, from Pub. Hlth. Repts., *56*, (Apr. 18, 1941): 18.

the life cycle of *Trichinella spiralis*, and second, through having broadcast the pitfalls which, if not avoided, will subject man to its invasion. This essential information is, in itself, sufficient to enable the waging of as successful a conquest against trichinosis as was so triumphantly waged against bovine tuberculosis. The cost of putting trichinosis under control would be but a pittance compared to the cost of controlling cattle tuberculosis, and the effort would be less difficult.

New York appears to be the first state to start a campaign against trichinosis in having recently passed laws and suggested regulations on its control. The Reports of the New York State Trichinosis Commission, popularly known as "Meat for Millions," and "The Meat You Eat," of which State Senator Thomas C. Desmond of Albany, is chairman, are informative and up-to-date reports reflecting both pro and con opinions. It is worthwhile for anyone interested in trichinosis to have copies of these reports at hand, as they are a reliable compendium on the subject.

In regard to the feeding of garbage to hogs, there is a division of opinion as to whether cooked or uncooked garbage is preferable. Some claims are made that the cooking of garbage has a tendency to make it homogeneous and that hogs tire of cooked garbage more readily than they do of uncooked garbage. These claims are probably well-founded. However, if our greater interest is centered in the production of pork relatively free from Trichina, rather than in the production of pork irrespective of its Trichina content, we will disregard the lesser palatability of cooked garbage in which it is presumed only the hogs are concerned, and put the more important issue of public health first.

If pork produced from the feeding of uncooked garbage were required to be identified so that the public could reject or select it when buying, it is believed that a discriminating public would show a decided preference for pork produced otherwise. Even if this presumption is incorrect, the fact remains that those producing pork on uncooked garbage are in competition with those who are producing pork with a relatively lower incidence of Trichina infection. The feeders of uncooked garbage are unquestionably contributing the lion's share in perpetuating the stigma atached to pork by being a medium whereby human trichinosis may be transmitted when, and if, it is eaten rare or uncooked.

In support of the statement that hogs fed uncooked garbage have a higher incidence of trichinosis than grain-fed hogs, reference is made to results of a survey conducted by the United States Bureau of Animal Industry, which appeared in the March, 1938 issue of the JOURNAL. This report shows that the incidence of trichinosis in hogs fed raw garbage is nearly five times as great as in grain-fed hogs. There seems to be no valid reason for not eliminating at once this known mass production of trichinous pork.

The following is a quotation from a publication by the United States Public Health Service, which, aside from being pertinent to the subject of trichinosis, is an authorative statement against which only the most presumptive would take issue:

> The logical solution of our problem is to have a control campaign so planned that medical men may, in a coöperative way, eliminate the hazard of human trichinosis, and assist the swine grower and packer to remove the stigma of trichinosis from their products. It is unnecessary to feed raw pork scraps to swine. Garbage feeders can cook garbage. In spite of all objections or statements to the contrary, it can be done and is done in many places, and it is compulsory in Canada and in England for all garbage not originating on the premises where it is fed. Whether every detail of cost, feed values, and other items meets with the entire approval of everyone concerned or interested is a minor matter compared with the public health as affected by garbage-fed hogs, of which about 5 per cent are trichinous. The farmer can feed his table scraps to his poultry, or cook them, but uncooked pork scraps must be kept out of feed for swine.
>
> The swine grower who follows the system of swine sanitation used by the Bureau of Animal Industry, a procedure which the writer pointed out years ago as our best control measure for trichinosis, has a legitimate complaint against the swine grower or feeder who maintains a filthy hog-lot or garbage-feeding plant to advertise to the world that, in spite of the general prevalence of modern business methods of producing and marketing food under clean and sanitary surroundings, there are

some swine growers who produce swine, and consequently pork, under filthy conditions. This procedure does the swine industry and the packer an injustice and a disservice, and they should be the first to resent it. As a part of a control campaign, it should be the business of the progressive swine grower to educate his less progressive associates, and of the packer to require that the product he buys be raised under such conditions as will give assurance that the packer will not be selling pork that may cause the illness or death of the innocent purchaser, and that will not involve the packer in damage suits for this loss of health or life. As the purchaser of the swine growers' product, the packer is in a position to require that what he buys meets certain reasonable specifications, and to refuse to buy swine that do not meet those specifications. By virtue of his extensive and well organized forces, and his long and intimate association with the swine growers and dealers, he can carry out such a program. It is to his best interest to do this. The big packing houses have accomplished much in the way of disease control, and will undoubtedly support a program of trichinosis control.[5]

PROPOSED PLAN OF CONTROL

The following suggestions, taken as a group, embody a tentative plan which, if they or their counterpart were enacted into law by all states and properly enforced, should have the effect of breaking the vicious life cycle of this parasite at places where its propagation is most abundant and thus lower the country-wide incidence of trichinosis in man and swine.

It has been suggested that the feeding of garbage shall be under the control of the livestock sanitary authorities of each state; that the application for a permit shall state whether cooked or uncooked garbage is to be fed; that when a permit to feed uncooked garbage is granted it automatically places all hogs so fed under quarantine; that the sale of hogs which have been fed upon uncooked garbage may be made only after a permit for such sale has been issued by the livestock sanitary board; that the sale of such hogs may be made for no purpose other than for immediate slaughter; that such hogs may be sold only to hog-slaughtering plants operating under federal or other comparable meat-inspection systems; that all hogs admitted to the premises of a plant feeding raw garbage shall, at the time of their admisison, be permanently identified by tattooing or otherwise marked so that their identity, thereafter, may be unmistakably maintained; that none of the pork derived from hogs fed upon uncooked garbage may be sold by the slaughterer in its uncooked state, but before being sold shall be cooked, or otherwise processed, in its entirety by methods known to be sufficient to destroy the viability of Trichina that may be present; that two years after the passage of the act regulating the feeding of uncooked garbage all permits in force for such garbage feeding shall be terminated and none others issued and, therefore, the only permits issued for garbage feeding will be for the feeding of cooked garbage.

It is the opinion of many who are interested in initiating some effective measures for the control of trichinosis, that the preceding suggestions or similar ones, offer a plan whereby the interests of the feeders of raw garbage are given all possible consideration consistent with public health.

Not so many years ago, a proponent of the feeding of uncooked garbage to hogs registered a complaint in a public address which was in effect as follows:

> That great discrimination would be imposed upon large-scale feeders of garbage to their peculiar detriment, when, for the alleged purpose of lowering the state-wide incidence of trichinosis in swine, any legislation were enacted that would compel this class of garbage feeders to cook all garbage fed to hogs unless such law did not also apply to farmers who feed their home-produced swill to hogs.

According to this reasoning, Congress and the legislatures of some states have already taken just such discriminatory steps against a companion industry, the large-scale hog slaughterer, through the enactment of meat-inspection laws. Meat-inspection laws, for the avowed purpose of creating public health measures for the common good, have decreed that large-scale slaughterers of food-producing animals shall submit all animals about to be slaughtered to a thorough inspection, including an inspection before slaughter, an inspection during slaughter and a reinspection after slaughter. But, animals

[5] Hall, Maurice C., Chief, Division of Zoölogy, Natl. Inst. of Hlth., U. S. Pub. Hlth. Serv.: Reprint 1975, from Pub. Hlth. Repts., *53*, (Aug. 19, 1938): 2, 6.

slaughtered by any farmer on his farm are exempt from such inspection. A farmer may slaughter the animals he raises and he may sell the meat derived therefrom anywhere, and at any time, without restraint in as far as the federal meat-inspection law applies to his products.

It is admitted that meat-inspection laws would more nearly approach the ideal if the meat originating in the plants of the large-scale slaughterer and the meats originating from animals slaughtered on the farm were subjected to the same official inspection; nevertheless, the wholesome and beneficial effect of the present federal meat-inspection law is such that it is unlikely anyone could be found who would propose going back to the *status quo* of the public meat supply as it existed prior to the enactment of the law. Large-scale slaughterers then feared that if the proposed federal meat-inspection act became a law it would put them out of business. It became a law, it didn't put them out of business, and they like it. It is firmly believed that the pangs, which the feeders of uncooked garbage experience every time there is public expression in favor of laws requiring the cooking of garbage fed to hogs, are but travail pains which will completely disappear when such laws are finally born.

In support of this belief, I quote from a letter dated May 28, 1942, which I received from A. E. Cameron, veterinary director general of Canada, concerning the subject of feeding uncooked garbage:

> There is no evidence to show that cooking reduces the food value of garbage and no complaints arise from garbage feeders in Canada on that account.

Condoning the mass production of swine trichinosis by continuing to tolerate the large-scale collecting and feeding of uncooked garbage to hogs is merely perpetuating the unfortunate stigma of trichinosis attached to pork and militating against the interests of enterprising swine raisers and all interests fostering it.

It seems worthwhile that consumers should be reminded frequently of certain well-known facts to offset the unwarranted fears that sometimes exist with reference to human trichinosis being associated with the eating of pork.

Trichina, if present in pork, will be killed when all parts of the meat are heated to a temperature of 137 F., a temperature which is lower than for milk as ordinarily pasteurized.

The rule, "Cook pork and its products thoroughly" means only that fresh pork should be heated sufficiently high so there no longer remains any pink or blood-red color anywhere in it. This pink or blood-red color disappears when all portions of the meat are heated to 163 F., a temperature at which the meat takes on a grayish or bleached appearance. It is unnecessary to cook pork until all portions are charred or dried out to render it safe with regard to trichinosis.

Hamburgers, according to official definition, should contain only chopped beef. Nevertheless, operators of hamburger stands often add some chopped pork. If the hamburger contains only chopped beef no trichinosis hazard can follow even if it is eaten rare. Neither can any hazard follow the eating of a rare hamburger to which pork has been added unless the added pork should happen to contain live larvae of *T. spiralis*.

While there are insufficient statistics available to prove conclusively that most subclinical cases of human trichinosis occur from eating rare hamburgers containing trichinous pork, it is quite reasonable to assume that the majority of them are brought about in this manner. The temperatures at which pork is customarily cooked in the home are more than sufficient to destroy any viable parasites that may be present. Therefore, it is plausible to conclude that the unsuspected exposure one encounters from eating hamburgers dispensed by over-busy hamburger stands may be the predominant cause of the recently found 17 per cent incidence of subclinical human trichinosis now existing in the United States. Also, the laity may not know that subclinical cases of human trichinosis are never known or suspected during the lifetime of the hosts and would never be known except through necropsies

performed for the specific purpose of ascertaining the incidence, approximately 17 per cent in the United States, of a parasitic infection that was in all probability never attended by perceptible physical discomfort.

The usual curing processes are not sufficient to kill any Trichina that may be present. It is necessary, therefore, to cook cured pork at just as high a temperature as fresh pork is cooked to insure the destruction of any Trichina that may be present. The red or pink color, however, persists in cured pork when it is heated so that one does not have the color change as an index that it has been heated to a temperature of 163 F., or above.

It is stated on very good authority[5] that the incidence of subclinical human trichinosis is higher in the United States than in any other country where large-scale microscopic examinations have been made of the cadaveric tissues of human beings who have died of causes unrelated to trichinosis. This high incidence of subclinical trichinosis must, of necessity, be the sequel of certain contributing causes peculiar to the United States. It is believed that the following may be the principal contributing factors that induce the acquisition of subclinical trichinosis:[6]

a) If it should be the *cŏmmon* practice to eat pork in a rare or partially cooked condition and the pork so eaten should have a low Trichina content;

b) If it is the *occasional* practice to eat pork in a rare or partially cooked condition and the pork so eaten should have a low Trichina content;

c) If, as under *(a)* and *(b)*, pork of medium Trichina content were generously mixed with nontrichinous pork or with other meats and portions of these mixtures eaten in a rare or partially cooked condition.

It is well known that the ingestion of trichinous pork is apt to produce subclinical or clinical human trichinosis depending upon the degree of Trichina infection of the pork which is eaten. When human trichinosis is acquired from the consumption of trichinous pork, the degree of human infection is likely to vary between widely separated extremes.

The United States Public Health Service has suggested the following tabulation as a convenient reference to the degree of infection:[7]

Very light—Less than 1 Trichina per Gm. of Diaphragm Muscle
Light—1 to 10 Trichina per Gm. of Diaphragm Muscle
Very moderate—11 to 50 Trichina per Gm. of Diaphragm Muscle
Moderate—51 to 100 Trichina per Gm. of Diaphragm Muscle
Heavy—101 to 500 Trichina per Gm. of Diaphragm Muscle
Severe—501 to 1000 Trichina per Gm. of Diaphragm Muscle
Critical—Over 1000 Trichina per Gm. of Diaphragm Muscle

Any group or society which plays the major rôle in bringing about the enactment of legislation seeking the control of trichinosis in swine by eliminating the feeding of uncooked garbage containing pork scraps will perform a service for public health rightfully expected of veterinarians—a service toward which the general public has long been complacent.

It is hoped that the American Veterinary Medical Association will give even further attention to legislation designed to lower the incidence of swine trichinosis and exercise anew its influence in endeavoring to have laws passed in every state that will prohibit the feeding of uncooked garbage containing pork scraps to swine. It is also hoped that every state and sectional veterinary association will proceed aggressively toward the goal that will outlaw the unforgivable practice of feeding raw garbage to hogs.

If the veterinary profession properly belongs in the roster of organizations looked upon as conservators of the public health,

[5]Cameron, T. W. M., Director, Inst. of Parasitology, McGill University, Macdonald College, P. Q., Canada: Reprint from Can. J. Comp. Med., (Nov. 1937): 10.

[7]Nolan, M. O., and Bozicevich, John, Division of Zoölogy, Natl. Inst. of Hlth., U. S. Pub. Hlth. Serv.: Reprint 1929, from Pub. Hlth. Repts., 53, (Apr. 29, 1938): 17.

here is a plain duty we have long neglected.

SUMMARY

The large-scale feeding of uncooked garbage to hogs, when such garbage contains pork scraps, as is now being tolerated in the United States, is declared by both the United States Public Health Service and the United States Bureau of Animal Industry (there are no higher or more competent authorities) as the principal factor in perpetuating the stigma of trichinosis attached to pork. Only when an overwhelming public sentiment is in accord with the human trichinosis phase of public health will the unpardonable but highly mercenary practice of feeding hogs uncooked garbage containing pork scraps be outlawed. The practice of feeding such garbage to hogs contributes nothing to society and serves only to replenish the purses of those engaged in the practice.

The incidence of human trichinois, clinical and subclinical, in any given area has been found to keep pace with the incidence of swine trichinosis in that same area. What are we waiting for?

Two Radio Programs on Livestock Health

Two timely series of radio broadcasts in the interests of livestock and poultry health have been launched this spring.

The first is over station WLW's "Everybody's Farm Hour" and is titled "Keep 'Em Healthy." The series was developed by Mr. Ed. Mason, director of farm programs for WLW in coöperation with the veterinary medical associations of Indiana, Kentucky and Ohio. The program will present timely suggestions on maintenance of livestock and poultry health in wartime and was prompted as a service in helping to control disease outbreaks.

The first guest speaker in this series was Dr. A. G. Madden of Madeira, Ohio, who, as a representative of the Ohio State Veterinary Medical Association, discussed "Livestock Health Suggestions to Increase Production." The second speaker was Dr. J. A. Winkler, Newport, Ky., of the Kentucky Veterinary Medical Association, who presented the topic "Next Year's Dairy Cow" on April 17. The "Keep 'Em Healthy" series is scheduled over WLW on two of its Saturday broadcasts during each month.

The second series of programs is sponsored by the Associated Serum Producers through their educational bureau, the American Foundation for Animal Health. It is an extensive campaign over 20 leading radio stations and urges the immunization of spring pigs against hog cholera. Farmers are advised that for reliable protection and best results, the vaccinating should be done only by veterinarians. This radio campaign ties in with educational material being issued to newspapers by the Foundation.

Veterinarians wishing to tune in this radio campaign may hear it on the following stations at the following hours:

KSO, Des Moines, Tuesdays and Wednesdays at 12:00 Noon, Saturdays at 12:15 p. m.; WNAX, Yankton, S. D., Mondays and Wednesdays at 12:50 p. m., Saturdays at 1:05 p. m.; KROC, Rochester, Minn., Mondays, Wednesdays and Fridays at 12:10 Noon; KATE, Albert Lea, Minn., Mondays, Wednesdays and Fridays at 12:35 p. m.; KYSM, Mankato, Minn., Mondays, Wednesdays and Fridays at 12:45 p. m.; KFAB, Lincoln, Neb., Mondays, Wednesdays and Fridays at 12:10 Noon; WROK, Rockford, Ill., Mondays, Wednesdays and Fridays at 12:05 Noon; WDGY, Minneapolis, Minn., Mondays, Wednesdays and Fridays between 12:00 and 12:30 Noon; WLS, Chicago, Mondays, Wednesdays and Fridays at 12:59 p. m.; WHO, Des Moines, Tuesdays and Thursdays between 12:00 and 12:15 Noon; KVFD, Fort Dodge, Iowa, Mondays, Wednesdays and Fridays at 11:59 a. m.; WFBM, Indianapolis, Mondays, Wednesdays and Fridays at 12:35 p. m.; KSOO, Sioux Falls, S. D., Mondays, Wednesdays and Fridays at 6:45 a. m.; KMBC, Kansas City, Mondays, Wednesdays and Fridays between 12:00 Noon and 1:00 p. m.; KSCJ, Sioux City, Iowa, Mondays, Wednesdays and Fridays between 12:30 and 1:00 p. m.; KOWH, Omaha, Mondays, Wednesdays and Fridays at 12:30 p. m.; WTAX, Springfield, Ill., Mondays, Wednesdays and Fri-

(*Continued on next page*)

Studies on Listerellosis:

V. A Note on the Use of Large Doses of Formalin-Killed Broth Cultures in the Experimental Prophylaxis of Ovine Encephalitis

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THE SPORADIC OCCURRENCE of ovine and bovine Listerella encephalitis in Illinois (Graham, Hester and Levine[1, 2]) has presented the problem of preventing the spread of the disease, as well as that of treating affected animals. In the field of specific chemotherapy, Porter and Hale[3] found that sulfanilamide and sulfapyridine were of value in the treatment of artificially exposed mice and reported the recovery of a human case treated with sulfanilamide, and Savino[4] reported on the use of sulfapyridine in a human case. Olafson[5] stated that Frost and Danks had cured an affected sheep with prontosil and a cow with sulfanilamide administered in large doses. Legner[6] apparently obtained encouraging results by the administration of repeated large doses (1,000 gr.) of sulfanilamide to naturally affected cattle. On the other hand, Henderson[7] could not obtain favorable results with sulfanilamide in one outbreak of listerellosis in a large flock of sheep, and Jensen and Gay[8] had no success in the treatment of ovine listerellosis with neoprontosil and sulfanilamide, except in two sheep in which treatment was initiated very early.

Among prophylactic measures are prompt isolation of affected animals and prompt disinfection of premises. These, however, have definite limitations during the winter months when the disease most commonly occurs. To aid such sanitary measures in the control of Listerella encephalitis, an effort has been made to produce immunity in healthy animals by means of bacterins. Graham, Morrill and Levine[9] were unable to immunize rabbits, guinea pigs, chickens, and sheep against artificial exposure to Listerella by means of single and repeated subcutaneous injections with a formalin-killed bacterin. Two doses of 3 to 5 cc. were used in the sheep without influence on the effect of subsequent intravenous exposure. They were unable to produce immunity in rabbits and chickens even by subcutaneous inoculation with living culture. Bovine antiserum with a titer of 1 : 50,000 also failed to protect rabbits and guinea pigs. Olafson (1940) reported that 2 to 3 doses a week for 6 weeks of 2.5 cc. of broth culture in sheep furnished complete protection against intracerebral exposure in 6 out of 20 animals and partial protection in 8 others. He stated that bacterins had been used in affected flocks without appreciable effect on the course of the disease. Julianelle[10] found that admixture of antiserum with living Listerella culture at the time of intraperitoneal exposure of mice failed to protect the animals.

Large Doses of Formalin-Killed Culture.—More conclusive information on the value of formalin-killed bacterin in preventing listerellosis was sought by administering large doses of formalin-killed broth cultures* to healthy ewes in one flock. In this flock of approximately 1,000 ewes, listerellosis had occurred during the winters of 1938-1939 and 1940-1941 with a mortality

From the Department of Animal Pathology and Hygiene, University of Illinois. (Levine: Assigned by the State Department of Agriculture to the Department of Animal Pathology and Hygiene to assist in diagnosis and research.)

(*Continued from preceding page*)
days at 12:45 p. m.; WMT, Cedar Rapids and Waterloo, Iowa, Mondays and Thursdays at 12:50 p. m., Fridays at 1:00 p. m.; KMOX, St. Louis, Tuesdays, Thursdays and Saturdays between 6:35 and 6:50 a. m.; WBNS, Columbus, Ohio, Mondays, Wednesdays and Fridays at 7:00 a. m.

*Listerella strain isolated from the brain of a typically affected ewe in this flock the preceding winter was seeded in beef broth, incubated at room temperature for 48 hours, and killed with 0.5 per cent formalin. Approximate density, McFarland tube No. 3.

of approximately 5 to 7 per cent. During the month of September, 1941, ewes were inoculated as follows: 175 yearling ewes and 101 grade Shropshire ewes in lot 1 were given 20 cc. of formalin-killed Listerella broth culture subcutaneously; 175 yearling ewes and 90 grade Hampshire and Southdown ewes in lot 2 were given two successive 20-cc. doses at intervals of one week; while 55 yearling ewes, 150 crossbred and Merino ewes and 116 Kansas ewes in lot 3 were given three successive 20-cc. doses, respectively, and the untreated lot 4. However, a chi-square value of 4.32 was obtained for lot 3 (which received three 20-cc. doses of bacterin) with a 5 per cent level of significance of 3.84. It could be expected that chance variation would cause such a difference approximately once in 25 times. Hence, the three doses of bacterin were probably effective in reducing the death losses. However, their immunogenic power was relatively feeble, since 3.4 per cent of the group died of listerellosis, and the administration of Listerella bacterin in the doses used in this study cannot be recommended.

TABLE 1.—Experimental Immunization and Natural Exposure of Sheep to Listerella Contaminated Premises.

Lot	No.	Ewes	Treatment—Subcutaneous Injection Listerella Formalin-Killed culture	Total Clinical* Encephalitis Number	Per cent
1	276	175 Yearling and 101 Grade Shropshire	9/8/41 20 cc.	12	4.4
2	265	175 Yearling and 90 Grade Hampshire and Southdown	9/8/41 20 cc. 9/15/41 20 cc.	13	4.9
3	322	55 Yearling, 151 Crossbred and Merino, and 116 Kansas	9/8/41 20 cc. 9/15/41 20 cc. 9/22/41 20 cc.	11	3.4
4	162	91 Yearling and 71 Crossbred and Merino	Controls	10	6.2

*Ewes only—31 spring lambs also succumbed to the disease.

Following inoculation, the animals were placed in contaminated sheds and lots on the same premises where the disease had occurred during two preceding seasons. The inoculated as well as the uninoculated control animals were in adjacent pens and received a ration consisting of corn silage supplemented with approximately one-fourth pound of soybean oil meal per head daily. The ewes in each lot also had access to salt, limestone, and bone meal mixture. Two or three weeks before lambing, all the ewes received approximately three-fourths pound of corn per head per day, but this was increased after lambing to one pound per head per day.

Listerella encephalitis (confirmed by bacteriologic examination) developed in 12 (4.4 %) of the animals in lot 1, 13 (4.9 %) in lot 2, 11 (3.4 %) in lot 3, and 10 (6.2 %) of the animals in lot 4 during the months from January until April, 1942, at which time the sheep were placed on pasture.

A statistical analysis of the results, using the chi-square method, was carried out by H. W. Bean, Department of Animal Husbandry. It indicated that there was no significant difference in the death losses between lots 1 and 2, given one and two 20-cc.

In the uncontrolled field trials, the use of much smaller single doses (2 cc.) was followed by cessation of losses. However, in these trials the sheep were turned out on pasture at the time of vaccination, and it is felt that this latter measure was the

determining factor, rather than the vaccination. It has been our experience that listerellosis is a disease of winter and spring, when the animals are crowded together, and that it disappears spontaneously when they are placed on pasture.

SUMMARY

A study is reported on the value in preventing spontaneous listerellosis in a large flock of sheep of formalin-killed Listerella broth culture administered subcutaneously. One and two doses of 20 cc. each of the bacterin were found to have no protective value, while three doses conferred a relatively weak immunity. Vaccination against listerellosis with these doses cannot be recommended.

The authors gratefully acknowledge the assistance of Dr. L. E. Boley in inoculating the sheep used in these observations, and Mr. R. J. Webb for the mortality records of each group.

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The urge to raise the nutritive level of white bread is world-wide. The strong preference for white bread is, however, difficult to overcome, the experts claim. Man eats what he likes and likes what he eats, regardless of remote consequences.

Writing: The Technique and the Art

The technique of writing is not construed as the art of writing. The one is all found in the little book on grammar, the other (the art) could not be contained on a whole shelf of the library. Like faces and personalities, there are as many kinds of writing as there are people.

* * *

Rules on the art of writing are as endless as the rules on behavior which can be but partly covered in the voluminous libraries of the legal profession—the statutes regulating human conduct through numberless acts of law-making bodies.

* * *

There can be no handbook on writing. Twenty rules on satire, ten rules on biting sarcasm, hints on wit and humor, some rules on common sense, how to acquire the delicacy of Dickens or the diction of Hugo are not contained between the covers of books. Writing is no more a science than thinking.

* * *

Above the level of grammatical polish, writing is either good, mediocre, or bad, depending upon what is said and how the words are lined up to say it. There are no rules for this either—patterns are too numerous. Dote on good grammar and never mind the fine points of rhetoric, if you write good stuff. The editor will slip in the semicolons. But, no amount of grammatical polish will make poor stuff good.

Veterinarians not interested in the history of their profession will find comfort in the questionnaire of the *New York Times* which revealed that 25 per cent of 7,000 college students did not know who was President of the United States during the Civil War and that many southern students replied that Jefferson Davis once occupied that office.

Large farrowings which wind up with fewer pounds of pork has many causes: rickets, influenza, enteritis, erysipelas, cholera and the whole gamut of swine troubles from baby pig anemia to the hazards of transportation.

Swine Erysipelas in Turkeys in the State of Washington

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THE TURKEY INDUSTRY has been rapidly increasing in the state of Washington in the past few years. This increase has been particularly noticeable on the west side of the Cascade Range because, until recently, it was thought that the damp climate of western Washington would not be conducive to the health of turkeys. As is usually the case, concomitant with this increase is a rise in disease incidence and the usual problem of control. Notable among the diseases causing losses to the turkey growers is swine erysipelas. Eight cases of this disease in turkey flocks have been diagnosed by the Western Washington Experiment Station in the past three years. From the histories of losses in flocks that we have not seen, it is apparent that considerable swine erysipelas in turkeys has not been diagnosed.

In turkeys, the symptomatology of swine erysipelas is indefinite. The birds generally become debilitated and somnolent. The onset of the disease is sudden and death usually follows in an affected bird within twenty-four to forty-eight hours. A yellowish diarrhea is present in most cases. The watery stool contains strings of mucus.

On postmortem examination, one usually observes an injection of the blood vessels of the cutis. There may be slight cyanosis. Ecchymoses and petechiae are observed subcutaneously. These hemorrhages are also found throughout the musculature, under the serous membranes of the viscera and under the pericardium. The liver may be slightly swollen and is usually extremely friable. The spleen is markedly congested. A marked enteritis is a constant finding. This enteritis is commonly catarrhal and may be slightly sanguinous. The oral cavity is frequently filled with a slimy mucus. Some characteristic lesions are produced which help in making a dignosis. A swelling of the caruncle or other parts of the head is frequently seen in the toms. Turgidity of the caruncle is apparently pathognomonic. Close examination usually reveals scabbed-over wounds. The yellowish diarrhea is quite typical and the thick mucus in the mouth is also suggestive. The growth of the organism in cultures made from the spleen, heart blood, liver and bone marrow confirms the diagnosis. If attempts to culture the organism from tissues of dead birds do not meet with success, a diagnosis of erysipelas is not indicated. The lesions of fowl cholera may look like those of erysipelas. Attempts to obtain cultures from the venous blood of live birds are partially successful.

In all of the erysipelas-infected flocks that we have attended, no definite source of infection has been established. The extensive distribution of *Erysipelothrix rhusiopathiae* is generally recognized. There are any number of reservoirs from which an outbreak may originate. We have observed that the greatest losses due to swine erysipelas in turkeys have occurred when accumulations of surface water are greatest.

Tom turkeys in prime condition are very susceptible to the disease. The incidence in hens is so low as to be almost negligible. The apparent preference for the toms may possibly be explained by their tendency to fight. Fighting results in breaks in the skin that are potential portals of entry for *E. rhusiopathiae*. One turkey grower debeaked his toms and reported that the incidence of erysipelas sharply declined.

In the light of our observations, we are inclined to favor the idea of *E. rhusiopathiae* being a soil saprophyte. The factors involved in causing the organism to become

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virulent are not known. As observed in Oregon by Rosenwald and Dickinson,[1] erysipelas in turkeys makes itself most evident in the winter months from November through February. We have found this to be the case in Washington. The greatest incidence has been in birds 5 to 6 months of age.

Numerous authors have expressed various theories concerning the most likely source of infection of *E. rhusiopathiae* for turkeys. One would naturally be inclined to investigate the possibility of hogs being the contributing factor. Sheep have received considerable attention in the literature as possible carriers. The proximity of swine or sheep to turkey flocks has had no part in the history of the cases observed by us. One outbreak observed by us is typical of the inexplicable nature of an erysipelas enzoötic. The range on which this outbreak occurred had been fenced off into small areas for segregation of the birds at marketing time. Each wire enclosure contained 200 to 500 birds; there were four separate enclosures in all. The entire flock had been ranged together until the time of segregation. After the birds were separated into the various market classes, erysipelas made its appearance in one of the pens. The visibly affected birds were moved to different ground. No new cases were observed after they were moved and erysipelas was not seen in any of the other groups. An erysipelas outbreak is not usually restricted to such a small area. However, we feel that this case is interesting and worthy of mention.

The usual methods employed in controlling erysipelas in hogs have been used by various workers in attempts to control erysipelas in turkeys. Commercial anti-swine-erysipelas serum has not given results that warrant its use and various vaccines that have been tried have proven to be of little value. In an attempt to find a means of combating erysipelas in turkeys, the Western Washington Experiment Station has used serum from infected birds that were moribund. The birds were exsanguinated aseptically by means of a cannula inserted in the carotid artery. The serum was collected and formolized. While the serum was separating from the clot in the blood of one of the birds that was used, the growth of *E. rhusiopathiae* became evident. This growth of the organism has not been observed in any of the other blood samples collected by us. Trials have been conducted to determine the therapeutic and prophylactic properties of the formolized serum. In flocks that suffered losses from erysipelas, the serum was used therapeutically in visibly affected birds. The dose adopted was 3 cc., inoculated intramuscularly. In an attempt to establish a diagnosis of erysipelas in some of the birds treated, blood was drawn aseptically from the brachial vein and inoculated on slants of nutrient agar. Fifty per cent of these blood cultures produced the growth of *E. rhusiopathiae*. Eighty-three per cent of the birds treated recovered. The extent to which the birds were affected varied widely in the cases treated. The results are promising, but the series of cases treated is too small to permit definte conclusions.

It is our desire to carry on some work with suspensions of *E. rhusiopathiae* with a view toward producing immunity in turkeys. The growth of the organism on laboratory culture mediums is very scant. To overcome this difficulty we have adopted chick-embryo cultures. The organism grows readily on the chorio-allantoic membrane of embryonated hens' eggs. The cultures carried on chick embryos at the Western Washington Station developed a virulence for the chick embryo after the fifth generation. Embryos inoculated after ten days of incubation have approximately 80 per cent mortality within seventy-two hours after the inoculation. The inoculum commonly used by us for inoculating embryos consists of the chorio-allantoic membrane of a chick embryo inoculated with the organism, triturated with 5 cc. of Locke's solution. Two minims of this inoculum are dropped on the chorio-allantoic

[1] Rosenwald, A. S., and Dickinson, E. M.; Swine Erysipelas in Turkeys, A. J. Vet. Res., 2 (1941): 202-213.

membrane of a normal ten-day embryo. One cc. of this inoculum, when inoculated parenterally, kills normal turkeys within three to five days.

A definite need for some means of treating swine erysipelas in turkeys is evident. This is especially true in breeding flocks. Poor coöperation could be expected from a large number of turkey growers if the recommendation to sell the normal breeders was made. This procedure has been advocated by some of the men that have dealt with erysipelas in turkeys.

Getting the normal birds off the land on which an outbreak occurs and taking every possible precaution to avoid water puddles are two of the measures we have found most satisfactory. Debeaking the toms is a good precautionary measure.

Erysipelas in turkeys takes a heavy toll. Little is known about controlling the disease, and in view of the economic losses involved, additional work on its prevention is certainly warranted.

Increased Livestock Production Goals in Russia for 1943

A dispatch from Moscow dated April 15 and printed in the *Chicago Daily News* of the same date recounts the series of measures instituted by the Soviet Union to bolster agriculture, which because of manpower mobilization and large regions still occupied by the Germans, remains one of the basic problems of Russian war economy.

The collective and state farms have been directed to make the following increases: cattle, 11.8 per cent, sheep 13.5 per cent, and pigs 16.4 per cent. The plan calls for more than doubling last year's poultry production.

The government will buy 2,800 breeding bulls to help restore livestock in liberated areas. Twelve thousand brood pigs will also be purchased.

The decree setting up the plan and goals to be attained notes improvement during the last year when cattle, sheep and goats numbered 11 per cent more than in 1941, but the number of pigs declined by 2 per cent.

Of interest to American livestock growers and veterinarians is the concern of the Russian government over high mortality in young animals, failure to take full advantage of unused pastures for winter grazing and poor husbandry in some regions. The decree makes minute provisions for improving breeding and care, forage is dealt with in detail and notice taken of the fact that "increased livestock population is not always followed by increased productivity."

Some of the steps ordered are: Calves under one year cannot be slaughtered without special permission; government meat requirements are to be obtained from unproductive stock so far as possible; breeding stock must be specially fed and more frequently bred; new barns are to be built where needed; slaughter of animals for leather is to be reduced to the 1940 basis for this commodity. Regional and local Soviets and the commissariat of agriculture are made responsible for the execution of the new production orders. From the extent of detail in the decree, it appears that the government is prepared to go to great lengths to solve livestock production problems.

Soldier and Dog

The National Canine Defense League of Great Britain *(The Veterinary Record)* is perturbed over the prospect of rabies being brought into that rabiesless country by soldiers and sailors returning from North Africa where that disease is notoriously prevalent. And, well may the League be perturbed. There is no such thing as a dogless army, nor a set of regulations that will separate a soldier from the K9 friend he made in the trenches. He'll get his dog ashore, and not perhaps.

More than 4,000,000 acres of farm land, previously untilled, has been placed under cultivation in England since the beginning of the war.

The Nomenclature of So-Called Infectious Enteritis of Cats*

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The problem of naming the disease which we know to be a *feline panleucopenia* has disconcerted the members of our staff for some time. In 1939, the writer suggested that we were not familiar with the nature of this disease, and in 1940, another member (Arlein) offered proof that this disease is the same as the one described by Lawrence and Syverton, and Hammon and Enders.[1]

During the past two years, it has been my pleasure to read carefully and from cover to cover each issue (spared by the U-boats) of several British veterinary journals. One thing about them has made a lasting impression on me—that is, that they settle their technical controversies openly, vigorously, and in print. It strikes me as being a worthy practice. The following is offered, if not to settle, at least to open a debate.

In 1939, the veterinary profession, at least that part of it which finds expression in writing, was chastized by Hammon and Enders[1] of the Harvard University School of Public Health who, when reporting their findings on feline panleucopenia, wrote as follows:

"The literature dealing with epizoötic diseases of cats contains frequent references to *distemper*, a term which has been applied to nearly all feline infections of a highly contagious nature. . . In recent years, there has been a tendency on the part of a few observers to apply the term *distemper* to an infection which is predominantly respiratory in nature and to designate as *infectious enteritis* a disease with marked gastrointestinal symptoms and lesions . . . The obvious confusion in respect to etiology and classification appears to depend, in our opinion, upon the fact that no pathological characteristics have been described by which the condition or conditions may be securely recognized or differentiated."

Slight precedence over these writers goes to Lawrence and Syverton (1938) who attached *agranulocytosis* of cats to the feline disease which all veterinarians know well as the common epizoötic cat disease. Here, then is the picture. The feline species of the mammal (man included) is the only one affected with a virus disease that is always characterized by a pronounced panleucopenia. This discovery was made by medical men who rightly claim that names formerly applied to this epizoötic disease were not only numerous and confusing but not accurately descriptive.

Since 1940, a separate ward has been maintained at the Angell Memorial Hospital for the isolation of cats affected with *feline panleucopenia*. On occasion, it has been noted that cats in this ward which are ill or recovering from, or immune to panleucopenia may develop coryza and present the clinical picture which well may be and has been described as distemper, *i.e.* sneezing, conjunctivitis, fever, pharyngitis —with a low mortality. For some years, it has been our practice to confine such animals in the canine distemper ward. One such sneezing cat can infect an entire ward in a day. What then shall we call this infectious coryza which resembles canine distemper? One might call it *feline cold* (God forbid), *rhinitis*, or *coryza*, or it would be understandable to call it feline distemper.

In 1940, Arlein[2], in a review of newer knowledge of feline enteritis and a report on passive immunization, made a plea to designate it as panleucopenia.

Strangely and unfortunately, when im-

*Submitted under the title, "An Open Letter to the American Veterinary Medical Association."

[1]Hammon, W. D., and Enders, J. F.: A Virus Disease of Cats, Principally Characterized by Aleucocytosis, Enteric Lesions and the Presence of Intranuclear Inclusion Bodies. Jour. Exp. Med., *69*, (March 1939): 327.

[2]Arlein, M. C.: So-called Infectious Feline Enteritis, North Am. Vet., *21*, (1940): 733.

mune serums against panleucopenia were commercially marketed and the term *distemper* was revived again, this epizoötic disease was so renamed.

Why the obvious name of panleucopenia should be submerged is beyond my ken. It is not a difficult word. Even laymen coming to our clinic have been heard to say, "I think my cat has panleucopenia."

Kelser in his latest edition (1943) of the *Manual of Veterinary Bacteriology* calls the disease *feline enteritis*, and names all of its synonyms. Hagan in his *Infectious Diseases of Domestic Animals* names it *feline infectious enteritis*, with synonyms enumerated. Gochenour[3] flatly calls it *feline distemper*. Although of his eight references, only one calls it by that name, three others call it *enteritis*. The other references are to the aforementioned medical writers who term it *leucopenia* or *agranulocytosis*. He (Gochenour) credits Leasure and his associates with "first determining the nature and etiology of the disease," yet goes on to state: "The change in the blood picture . . . is the only constant finding." The credit for the discovery of the blood changes belongs to Lawrence, Syverton, and Hammon and Enders. Why then should we perpetuate the confusion by renaming the disease *feline distemper*? Surely, panleucopenia is not too difficult a word to learn since even the laity of Boston know it by that name unless they have been confused by commercial literature perpetuating the name *distemper*.

Is there a purpose behind the revival of what should be, in the interest of scientific veterinary medicine, a well-buried name? We shouldn't be ashamed to give credit outside our profession if that is where it belongs. Has not the medical profession given credit to one of our members who perfected a good splint? Grudgingly perhaps, and understandably so. Nevertheless, the confusion which is being maintained in our own profession regarding the name of this feline disease is no credit to any of us.

Comment.—Installments of *Publication Rules of the AVMA*, which have been expanded far beyond the original intention, point out what the author has aptly proved in this article, namely, the need of revising veterinary nosology and terminology. No better example could have been selected in behalf of such a revision than our prosaic *distempers* which have lived too long on the list of animal diseases. *See* page 278, April (1943) issue of the JOURNAL. Horse distemper is nearly forgotten, superseded by new names, but canine and feline distemper waits for the action of a competent committee. Naming virus diseases of variant organic pathology, properly, is the problem.—Ed.

[3]Gochenour, W. S.: Feline Distemper, North Am. Vet., 24, (1942): 104.

Certain Conditions in Germany

A decree from the fuehrer (Aug. 26) making radical changes in the command of the medical and health services indicates that the state of public health needs improving.

The number of livestock has been rapidly increased, but owing to shortage of feed, there are too many animals and too little meat. Animals, ill fed and slaughtered thin, have low food value. A goose brings more than a malnourished calf; a pig cost 700 francs (= $35.00) according to *Paris-Soir* (Sept. 16). Winter conditions will be hard. Want is appalling. Food is the biggest question of the moment. [Knowing these facts, the pleas of Secretary Wickard are understandable.]

Interviews of the crew of a shipwrecked Swedish vessel, who sojourned for a time in Germany, revealed that the status of the German people is unpleasant. Food is bad and there is not a scrap of soap obtainable. Their [crew's] general impression was that the German population is longing for peace regardless of who wins the war. [*Excerpts from "Medicine and the War," J.A.M.A., cxx (Nov. 14, 1942), pp. 848-849.*]

The veterinary profession is yet to learn that offense is the best defense and that there is no dignity whatsoever in being too proud to fight for the rights of its members. The choice is between being soldiers or just cannon fodder.

Share your earnings with our soldiers, sailors, and marines. They give their lives—you lend your money.

Publication Rules of the AVMA

Units of Weight, Volume, Length

L. A. MERILLAT

There is but faint hope of reform in designating weight, bulk, and length in current scientific articles. The systems used and misused are not only complicated but quite confusing to the casual bystander. To be transposed into so-called equivalents are (1) avoirdupois, (2) apothecaries' solid, troy, apothecaries' liquid or wine, (3) imperial (fluid), and (4) a flirtation with metric. The confusion arises mainly in not using one of these entirely to the exclusion of the others, and being English, we have B.P. weights and measures to distinguish from our U.S.P. units. Quite commonly, one is sorely tried in detecting which one of these systems a writer is using in setting down quantities of solids and liquids.

Taking pounds, ounces and drams to illustrate, there will be found cows weighing 1,000 pounds (obviously, meaning avoirdupois) that are given 1 ounce of a solid drug which in apothecaries' (troy) weight would mean 8 drams or 480 grains, and in avoirdupois 16 drams or 437.5 grains. Were vaunted accuracy in dosage to be carried out in terms of cow-pounds, the figures would have to correspond to drug-pounds, and, were this avoirdupois-weighed cow given a liquid pound (pint), she would receive 16 ounces avoirdupois, 12 ounces wine measure, or 20 ounces imperial measure. The difference per dram would be as 7,680 is to 9,600 (minims). Although the latter (imperial) is not standard in this country, we do read British books and journals where, for example, one will find the gallon is as 1 is to 1.2011. These confusing figures are given to show that care is needed in transposing British weights and measures to American units. For accurate information on all of the denominations of all of the systems found in English literature, one must consult the complete tabulation. What can not be consistently dodged is familiarity with American usage for avoirdupois weights and apothecaries' measures as indicated in the following U.S.P. tables:

Avoirdupois Weight

Pound	Ounces	Drams	Grains (troy)
1	16	256	7000
.	1	16	437.5
.	..	1	27.35

Apothecaries' (Wine) Measure

Gallon	Pints	Ounces	Drams	Minims
1	8	128	1024	61440
.	1	16	128	7680
.	.	1	8	480
.	.	...	1	60

But all is not that simple. Liquids heavier or lighter than water have to be converted from the cubic dimensions of these measures according to their specific gravity. That is, a liquid is to its weight what its weight is to its specific gravity. Then, in converting drops to minims, one gets into deep water because the 60 drops per dram of pure water applies to but a few liquids. The variation ranges from 44 to 250 drops per dram among the commonly used drugs. The drop, without knowledge of its volume for each drug, is a useless unit of measurement.

The Metric System

What habit creates, people are loath to discard. Notwithstanding that the archaic systems of physical measurement, the vogue in English-speaking countries, compared with the metric system have no defensive arguments except habit. The prospect of abolishing them is meager. The cost would be tremendous and the confusion would be lasting in populations brought up to think in terms of their own units. Although science has adopted the metric system, it makes a poor showing because of thinking in one system and writing in another. Thinking avoirdupois and writing metric requires too much mental arithmetic—multiplication table, short division and rows of decimals. Proof of this is the timidity shown in extending metric measurements beyond the capacity of the graduated sy-

ringes and glassware handled. Stallions and bulls are not weighed in kilograms nor hay in metric tons; nor are horses raced in kilometer heats or pastured on predial hectares. As a matter of fact, between the milligram and the kilogram, mainly the gram gets into print. Every thing above the "kilo" is an uncharted sea. Ignorance of the metric system is as astounding as its partial use, and as the admixture of its units with those of the other systems is faulty. We have articles containing such phrases as "100 *kilos* of fertilizer per *acre*," "5 *milligrams* per *pound* of body weight," "dilute 10 *cc.* in a *pint* of water," "0.1 *mg.* per *kilo* of live weight," in one paragraph and "3.0 *ml.* per 100 *lb.* of body weight" in the next, and "the lesions averaged 3.0 *cm.* long and 1.5 *cm.* wide scattered over a zone of denuded skin a *foot* in diameter." These are a few of many examples proving that thinking in metric terms is a restricted accomplishment — restricted to what we know from having seen and handled the thing spoken of. Were it desirable to overcome the use of these verbal incompatibles, we would first have to think in *kilometers* for distance, *kilograms* for weight, *liter* for the bulk of liquids, *hectare* for area, and forget that there are any other words to use. That this is not coming to pass is self-evident. The alternative lies in agreement as to where to stop the metric and take up our own system in expressing length, weight, bulk and area (sq. measure). That, as much as any other style of usage, comes within the province of the proper council of our association in so far as veterinary writing is concerned. There would be reason for stopping at certain stated points in the upward direction, *e.g.* at the *liter* for liquids, the *kilogram* for solids, and at the *centimeter* for length. Square measure could be ignored since there is little prospect of getting acquainted with the *hectare*, in either the upward or downward direction. On the other hand, the square centimeter ($cm.^2$), like the cubic centimeter ($cm.^3$), is perhaps comprehensive enough to be retained. In the downward direction, science helps itself by borrowing the Greek mu (μ and μμ) for tiny lengths. It would seem preposterous to express *mile, knot, league, section* (land), *hogshead, barrel, ton* in metric figures, or in reverse, burden the mind with *quintal, kilostere, centiare, are* and others of the unused words of the metric system.

In short, the claim that scientists use the metric system exclusively is only partly true—about 5 per cent true. It is not feasible to use more of it.

Expressing units in the metric system, showing in parenthesis the equivalent of our own system, is good usage. Although, for such familiar units as gram, cubic centimeter and kilogram, except for lay readers, the equivalents would seem superfluous.

A convenient way to amuse one's self in metric prescription writing without straining the mind is to think of the grain and mimim as *0.065*, the dram as *4*, and the ounce as *30*, and forget everything else, provided trivial variation in dosage is not consequential. Greater precision is seldom of importance outside of the laboratory. By remembering these three figures, one can keep the druggist believing in one's mastery of the metric decimals. For example:

Morphine sulfate	0.065
Atropine sulfate	0.130
Rose water	4.000
Distilled water *q.s.*	30.000

meaning a grain of morphine, 2 grains of atropine, 1 dram of rose water and an ounce of water. Thus, 60, 120, 240, 480 and 960, simple multiples of 30, represent 2 ounces, 4 ounces, 8 ounces, 1 pint, and 1 quart. The half liter (500) and the liter (1000) are avoided because druggists do not always have bottles of such size on hand.

Simplified Spelling

Lopping off and gouging out letters from certain English words has been a pastime for many years with no little effort to make the revision a science. For nearly fifty years, philological societies of England and the United States have been recommending radical orthographic changes with but moderate success. The *a* was taken from aecology, anaemia, anaesthesia, aether, aetiology, aequator, aethics, mediaeval, haemorrhage; the *e* out of anaelgesia; the *u* out of

favour, humour, honour, tumour, and other words in every day use in veterinary writing. And, although not shortened, *titre, litre, theatre, nitre, fibre, centre,* and others went to the *er* ending. But the reform was not universal, for in England these diphthongs and diagraphs are still used, as veterinarians need not be reminded. If simplified spelling is a trend it is not the revolution its sponsors had hoped.

At the turn of the century, Andrew Carnegie sponsored a society called the Simplified Spelling Board of New York which proceeded with hope and zest to revolutionize English orthography. The effort was abortive. Although that board published a list known as "The Three Hundred Words" in 1906, the reformed spelling was but slowly and partially vulgarized. Having touched a popular chord with *tho, altho, thru, thoro, boro* and others, for the nonce, the modifiers were so enchanted that they proposed 3,000 additional victims for their guillotine and gouge. What happened is well known. The butchering of words was found to lack popularity. While we *plow* and *milk* instead of *plough* and *milch,* the *tho's* and the *altho's* and the *thru's* are losing instead of gaining caste and ground. Editors are loath to use them. Their admission into the literary sanctum is blocked. Yet, slowly and surely some do crash the gate, and remain as welcome guests. *Draft, plow, quartet, coquet, etiquet, sulfate, sulfur, esophagus, mortis,* have come to stay, and while none has any repugnance for *catalog,* few will approve *dialog, pedagog, colleag,* and *harang.* Allegorically, simplified spelling is only a creeping vine slow to root and slower to bloom, but a plant that is always here ready to encroach upon the garden of the masters.

Fortunately, language like veterinary science has its guardians who prevent the intrusion of harmful agencies.

A fact worth stating in connection with our military adventure in North Africa is that rabies in dogs is prevalent there and that unmanaged dogs are numerous. It was in French Morocco that scientifically controlled rabies vaccination in dogs was first practiced on a large scale.

The Appareil and the Saddle

"Mules Replace Jeeps in Tunisia" was a nation-wide headline of April 3, 1943, after American troops were able to capture an important position with the mule and appareil of the early days bringing up the supplies. When and if Rommel is driven into the sea it may be the mule who "turned the trick," and it's not a wild guess to say that when the troops of the United Nations march into Berlin they will ride in on horseback. The ofttime repeated warning that "the nation that goes to war without horses is licked from the word go" is likely to be re-proved even as of the mechanized blitzes of World War II, for when the machines are equal on both sides, transportation of, and for, troops in the field falls to the quadruped: the horse, the mule, the camel, the dog.

Plagues of Animals

Gold, ivory, incense, and slaves, the loot of former conquerors, have been superseded by things to eat—by protective food, not luxuries for the ruling class. Plagues of domestic animals and the hunger they connote have had world-wide political consequences and they are ever biting at the flank of fighting nations. Hog cholera and Texas fever alone can bring the American people to grief they could not survive. What statesman, quarreling in Washington over many things, has spoken more wisely than Congressman Gillie when he warned the Congress against playing fast and loose with the veterinary service? What matters all these political harangues if the white man's science is thrown to the winds or not known to exist?

To learn a foreign tongue or two is but a matter of years, but to know one's own tongue well is a lifetime job.

And don't confound the language of the nation with long-tailed words in *osity* and *ation.—Canto i, line 6, The Monks of the Giants.*

Experimental Alteration of Thyroid Function in Cattle

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THE THYROID in cattle is composed of two lobes connected by a well-defined isthmus. Although it is not within the scope of this paper to review its many and complex functions, it is in general concerned with: (1) the regulation of the rate of general metabolism, (2) the rate of tissue differentiation and body growth, and (3) the sensitization of all tissues to epinephrine, the hormone of the adrenal medulla.

In a general way, hyperthyroidism is usually manifest by increased metabolic rate, loss of or failure to gain weight, nervous instabilty, and disturbances of the cardiovascular and gastrointestinal systems. Hypothyroidism is usually recognized by decreased metabolic rate, generalized obesity, sluggish mentality and behavior, and, in young animals, retarded growth.

Although the thyroid function of cattle has not been extensively studied, some comparisons between beef and dairy cattle have been made. Krupski (1921) reported that dairy cattle thyroids are heavier than those of beef cattle, and Krizenecky (1932), as reported by Ralston, *et al.*,[1] found that the glands of dairy and beef cattle averaged 32.5 and 24.4 Gm., respectively. Reece and Turner[2] found that the hypophyses of dairy cattle contained more of the thyrotropic hormone than did those of beef cattle and suggest that this may partially explain the differences in thyroid size of the two types of cattle.

Since the available evidence indicates that dairy cattle have larger and more active thyroids than beef cattle, and since the differences in type, temperament, and performance of dairy and beef animals indicate differences in thyroid activity, it was believed desirable to study the possibilities of regulating the growth and fattening of cattle by alteration of the normal thyroid function.

MATERIALS AND METHODS

Animals.—Eleven purebred beef and one purebred Holstein steers were used in this study. The animals ranged in age from 3 to 18 months and in weight from 365 to 993 pounds at the time of operation.

Ration.—The steers were fed about 3 pounds of good quality clover hay daily and approximately 19 pounds of a grain ration composed of: 1.5 parts ground corn, 1 part ground oats, 1 part wheat bran, and 0.5 part linseed oil cake. The grain was moistened with 1.5 quarts of molasses in 4 quarts of water just before it was fed.

Histological Procedures.—Portions of the thyroid were immediately fixed in Bouin's fluid at the time of operation and at the time of slaughter in those cases where thyroid remnants could be recovered. The tissues were dehydrated in the butyl alcohol series, sectioned at 8 microns, and stained with hematoxylin and orange G or eosin.

Terminology.—For comparative purposes, the gains following thyroidectomy are expressed in terms of cumulative daily gain following recovery from the operation. Since any surgical procedure is accompanied by temporary weight loss, it was decided that the approximate day on which preoperative weight was reached would be designated as the recovery day.

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[1]Ralston, N. P., Cowsert, W. C., Ragsdale, A. C., Herman, H. A., and Turner, C. W.: The Yield and Composition of the Milk of Dairy Cows and Goats as Influenced by Thyroxine. Mo. Agr. Exp. Sta. Res. Bul. No. 317, (1940).

[2]Reece, R. P., and Turner, C. W.: The Lactogenic and Thyrotropic Hormone Content of the Anterior Lobe of the Pituitary Gland. Mo. Agr. Exp. Sta.

Table 1. Ages, Body and Thyroid Weights of Steers

Steer	Birth Date	Operation Date	Pre operative Weight	Final Weight	Thyroid Removed at operation	Thyroid Recovered at slaughter
			(lbs)	(lbs)	(gms.)	(gms)
1S*	9-3-36	10-10-37	900	1245	-	-
2A	6-6-39	5-16-40	580	873	28,1	6.9
3H	4-28-39	6-7-40	880	1200	51.8	24.0
4H	5-31-39	6-18-40	785	1140	26.7	15.6
5A	2-23-39	7-5-40	800	1000	44.4	43.8
6S	1-27-40	7-16-40	435	669	21.5	-
7S	6-5-39	12-23-40	890	917	17.1	43.3
8S	7-4-39	12-23-40	993	1013	44.3	61.7
9H	6-6-40	2-12-41	500	912	39.4	102.4
10S	6-7-40	3-12-41	447	870	42.4	15.5
11A	6-28-40	4-15-41	604	823	44.9	none left
12Hs	12-2-40	4-8-41	365	780	19.2	12.9

* S = Shorthorn, A = Angus, H = Hereford, Hs = Holstein

Weight losses of 10 to 85 lb. were observed and recovery required from 7 to 36 days.

SURGERY

In order that all steers might regain their preoperative condition as quickly as possible, it was important to have healing take place by primary union; therefore, all operations were carried out under the most strict aseptic conditions possible. In only one case did suture infection develop, and that was where it was thought necessary to pack due to persistent hemorrhage. This occurred in one of the first cases before the standard technique was adopted.

The first nine steers were operated on by using a midline incision. With this method, all that we were able to do was a subtotal thyroidectomy. Here, interrupted overlapping mattress sutures were inserted across the middle of each lobe and the ligated portions removed together with the isthmus.

The remaining three cases were operated on by a somewhat altered technique, which turned out to be much more satisfactory. In this group was included the Holstein-Friesian steer calf. This is mentioned at this time because our limited experience would indicate that dairy animals are much more easily operated on than beef cattle. Age also is an important factor. The younger the individual, the much less difficult is the operation.

Briefly, the field of operation was prepared by clipping and shaving. The entire area was scrubbed with carbon tetrachloride and then followed by two liberal applications of tincture of metaphen, with several minutes elapsing between applications.

Restraint consisted of securely fastening the steers on the operating table in the dorsal recumbent position, with the head and neck extended and elevated by use of sacks of straw.

The method of anesthesia varied, from pure chloroform inhalations at first to a standard procedure consisting of preoperative sedation accomplished by the administration of approximately 2 oz. of chloral hydrate, dissolved in 1 gal. of water, through the stomach tube. This was given immediately before placing the animals upon the table. To secure complete surgical anesthesia, nembutal solution was injected intravenously. The amount required ranged from 20 to 30 gr.

All surgical instruments, shrouds, gloves, and sutures, with the exception of the already prepared sterile catgut, were sterilized at 15 lb. for 15 minutes.

The shroud with a window in it was placed over the operative field before the skin incision was made. Following this, the standard technique for protecting and covering the edges of the skin was carried out by using towels and Bachus towel clamps. The operation of choice consists of an incision about six inches in length made at right angles to the midline and approximately one inch posterior to the arch of the cricoid cartilage. It was carried completely through the skin as nearly as possible in one long stroke. Very little subcutaneous tissue is encountered and by careful dissection the two opposing sterno hyoideus muscles could easily be seen. They were separated by blunt dissection on the midline, which is their natural medial border. These free borders were slightly retracted to expose the isthmus of the thyroid gland. At this point, by careful blunt dissection, the isthmus could be followed and the lobe exposed. To facilitate this phase of the operation, the head and neck were carried slightly to the side of the operator to relax the muscles and tissues and allow easier exposure. If, however, much difficulty was encountered at this stage, the sterno hyoideus was transected with impunity. By using closed scissors, one could now work down, keeping as close

Table 2. Average Cumulative Daily Gains of Steers.

Steer	Weeks Following Recovery from the Operation														
	1	2	3	4	6	8	10	12	14	16	18	20	22	24	26
1S		5.0			4.6		3.2		2.9		2.5				
2A		3.0		3.6	3.1	2.6	2.5		2.2	2.2	2.2	2.1			
3H		1.8		2.9	2.6	2.1		2.1	2.2	2.3	2.1	2.3			
4H		3.2		2.8	3.2	2.7	2.6	2.6	2.5	2.4		2.5			
5A		2.8		1.4	1.4	1.4	1.8	1.8		1.8					
6S		2.6			2.7	2.3	2.3		2.3						
7S	.4		1.4												
8S		1.7													
9H	1.1	2.7		2.4	1.8	2.1	2.0	2.3	1.9	1.7	2.0	2.0	2.0	2.1	2.1
10S		2.3		2.4	2.1	2.4	2.0	2.2	2.0	2.2	2.2	2.1	2.2	2.2	2.2
11A		2.1		1.5	1.4	1.3	1.3	1.4	1.4	1.4	1.1	1.0	1.0	1.0	
12Hs		4.5		3.1	3.1	2.2	2.2	1.9	2.1	2.2	2.1	2.3	2.3	2.4	2.4
Ave.		2.9		2.5	2.6	2.1	2.2	2.0	2.2	2.0	2.0	2.0	1.8	1.9	2.3

as possible to the lateral surface of the lobe; then in a similar manner, the medial surface was separated. About midway over its lateral surface, a narrow ribbon-like band of the omo-hyoideus muscle was encountered. This could also be transected. This allowed comparatively easy access to the lowest point of the gland, which of course is dorsal when the animal is in its natural standing position. In the limited number of cases observed, the transection of these muscles had apparently no bad effect.

The next phase is one of the most important, due to the fact that the large artery must now be carefully exposed where it is seen entering the lobe at the anterior-lower border. The artery should be exposed sufficiently so that a double ligation can be applied with a quarter of an inch of the stump remaining. This avoids any possiblty of the suture slipping off. It is also advisable but not absolutely necessary to ligate the vein.

By bending the head and neck to the opposite side, the same procedure is repeated. In removing the lobes, one must be careful in handling them as they are fragile and tear or macerate easily. We have found that the use of tongue forceps is helpful in avoiding these accidents. By following this procedure, both lobes and the isthmus can be removed in their entirety.

The operation is completed by bringing the skin edges into apposition by using any one of several types of skin sutures, such as the interrupted, mattress, or the continuous lock stitch. We have had entirely satisfactory results with the latter suture when the transverse incision was used. In all cases, we used No. 19 noncapillary, braided silk. After completion, the skin sutures were then covered with sterile vaseline daily for several days. No particular after care is necessary. These sutures are removed in about a week or 10 days.

RESULTS

Although marked individual differences in response following thyroidectomy were observed, certain trends were apparent. During the first four to six postrecovery weeks, the rate of gain was consistently accelerated and after the sixth week the rate of gain was reduced. This response is undoubtedly explained, at least in part, by the marked hypertrophy and hyperplasia of the thyroid which developed following the operation. In only two steers, 6S and 11A, were thyroid deficiency symtoms observed. About three weeks following operation, the hair of 6S became dry and brittle, and although he continued to gain, his general appearance was not thrifty. About seven weeks following the operation, the hair again became fine and

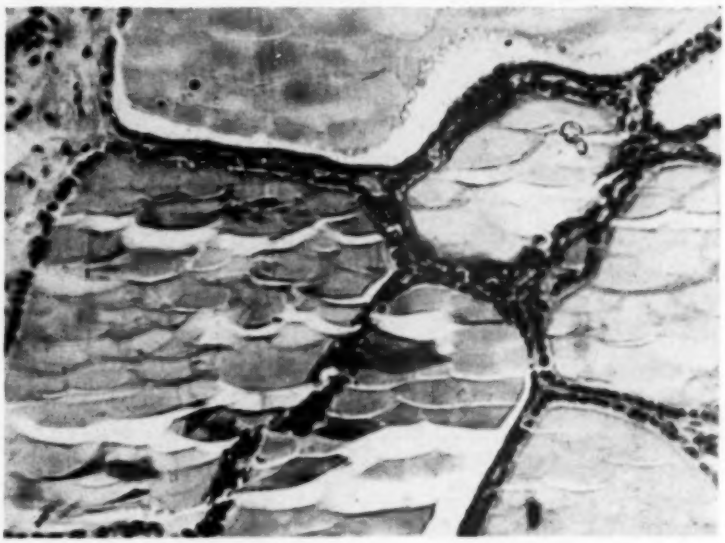

Fig. 1. — Photomicrograph of thyroid section of steer 10S at the time of operation, 3-12-41. The low cuboidal epithelium and large masses of colloid are characteristic of the normal gland. Magnification x150.

silky and the calf bright and active. This response is most logically explained on the basis of thyroid hypertrophy of sufficient extent to overcome the thyroid deficiency. Steer 11A exhibited the first symptoms of thyroid deficiency within the first postoperative month. His hair became progressively dry and brittle, and by the end of four months, the skin was thick and dry, his appetite was poor, and constipation chronic. Desiccated thyroid gland was fed, and between Aug. 21, 1941, and Oct. 23, 1941, 109.5 Gm. were administered. This material was fed in No. 10 gelatin capsules in amounts varying from 1.3 to 3.0 Gm. per day. Three Gm. per day were easily tolerated and at the end of the treatment with desiccated thyroid, the hair had become brighter and finer, the skin more pliable, appetite had increased, and the steer had become more active. At the time of slaughter, no thyroid tissue could be found in this steer.

As shown in table 1, the amount of thyroid tissue removed at operation ranged from 17.1 to 51.8 Gm., and yet in all the steers examined at slaughter, with the exception of 11A, appreciable amounts of thyroid were recovered. In 9H, 39.4 Gm. of tissue had been removed at operation (the bulk of the gland as determined by careful gross examination), yet 102.4 Gm. of tissue were recovered at slaughter. Histological examination of the thyroid at operation and at slaughter indicates that not only is there marked hypertrophy of the individual cells but considerable hyperplasia of the thyroid fragments, or possibly accessory thyroid tissue, which were not removed at operation.

The normal thyroid gland is made up of many epithelium-lined, irregularly spherical follicles, the lumen of which usually contains a deeply staining, iodine-rich colloid. The epithelium is usually of the low columnar type, becoming very low and flattened in appearance in an underactive thyroid gland and very tall and folded in an overactive gland. In fig. 1, a section of the thyroid of 10S at the time of operation is shown, and in fig. 2, a section from the same steer at the time of slaughter demonstrates the marked hypertrophy of the gland following operation. Although the output of thyroxine before and following operation could not be determined, it would seem evident that thyroid deficiency symtoms were prevented from appearing because of the hypertrophy and hyperplasia of the thyroid remnants. The fact that deficiency symptoms in 6S were overcome without treatment tends to support this view. The fact that rate of gain, as shown in table 2, was increased during the first six postrecovery weeks and decreased after this time can be accounted for in at least

Fig. 2.—Photomicrograph of thyroid section of steer 10S at the time of slaughter, 2-11-42. The presence of thin, vacuolated colloid, tall, columnar epithelium, and the crowded condition of the nuclei are characteristic of the over-active thyroid gland. Magnification x150.

two ways. The retardation in gain during the recovery may have been compensated by an increased rate of gain following recovery to preoperative weight, but it would seem logical to expect that the temporary decrease in thyroid activity during the postrecovery period resulted in decreased metabolic rate and consequently increased body weight. The fact that the gains were decreased after the sixth week, supported by histological evidence, would seem to indicate that thyroid activity had brought about increased metabolic rate and consequently reduced rate of gain. The average cumulative daily gain of 17 control steers during a five-month period was 1.8 lb.

SUMMARY

1) Eleven purebred beef and one purebred Holstein-Friesian steers were used in this study.

2) The thyroid was most satisfactorily removed through a 6-in. skin incision made at right angles to the midline and approximately 1 in. posterior to the arch of the cricoid cartilage. The gland was bluntly dissected, the large artery entering each thyroid lobe at its anterior-lower border carefully exposed and doubly ligated, and the thyroid excised.

3) The average cumulative daily gain during the first six postrecovery weeks was 2.6 lb. and had decreased to 2 lb. at the end of 20 weeks.

4) A histological study of the thyroid tissue recovered at the time of operation and of the remnants obtained at slaughter showed that marked hypertrophy and hyperplasia occurred following the operation.

In a study antepartum of 380 women of the low income class checked against 90 controls, Ebbs, Tisdall and Scott (*Journal of Nutrition* [Phila.], Nov., 1941) found that the well fed mothers enjoyed better health, had fewer complications during gestation, and proved to be better obstetrical risks. Miscarriages, stillbirths, and abortions were more frequent in the women on poor diet, and the difference continued in the offspring up to 6 months.

Wound Healing

In Russia, wound healing by transplanting tissues is widely practiced. Chloraclyde-treated dead tissues are used in treating fresh and granulating wounds, and for transplantation even better results are obtained. The basis is experience with hundreds of chronically nonhealing ulcers, fistulas, burns, frost-bites, skin diseases, and corneal lesions. Chemically treated pericarpoidal (obviously meaning pericarpal) skin from corpses or abdomens of animals are used after careful preparation. The wound is drained, then treated and sprayed again with chloraclyde solution. A piece of skin but slightly smaller than the wound is laid on its surface and fixed with sutures. Pain ceases a few hours after the transplanting. Under the graft, healing is more rapid than from the usual aseptic treatment.

Stimulation of regeneration is effected also with emulsion of embryonal tissue, carefully ground, taken from guinea pigs and used with a castor oil base as a liquid. This emulsion has proved to be decidedly beneficial when the healing process of granulation is sluggish and epithelial regeneration is slow. This treatment has unquestionable influence on epithelization.—[*Dr. S. Philipchuk, Executive Secretary, Moscow Soviet Scientists Anti-Fascist Committee: Wound Healing, Science, 97, (Feb. 12, 1943): 162.*]

Leprosy, according to the U. S. Public Health Service, is not very "catching" in this country and the number of cases are few—49 new cases in 1941. The government maintains the National Leprosarium at Carville, La., where lepers may go for the best treatment known. Quarantine regulations prevent the admission of recognizable cases.

Buckle down, neighbor—buy more bonds than you can afford, just like you used to buy a better car than you could afford. REMEMBER, IT'S FOR GUNS AND TANKS AND PLANES FOR THE BOYS WHO ARE FIGHTING THIS WAR.

CLINICAL DATA

Vitamin Pills and Mineral Supplements

Between the soil where feeds are grown and the cytoplasm where they are broken up and used, there are many mutations to consider in the study of nutrition. Malnutrition in animals, expressed in stunting, underweight, rickets, anemia, blindness, infertility, blacktongue, and many other débacles, has numerous causes: soil deficiency, faulty storage, spoilage, poverty, ignorance, infection, fads, frauds, misleading advertisements, and the denaturing effect of manufacture. The situation is so critical in human and veterinary medicine that doctors find it safer to prescribe vitamin pills and minerals than to depend on feeds of unknown protective value, beneficial as it might seem to seek these in their natural form. The use of vitamins and minerals to reinforce human food and animal feeds has been lifted to the dignity of a national problem of paramount importance in the prosecution of the war.

Botflies

Botflies (=Oestridae) belong to a family of insects of the order Diptera living as parasites of mammals in the larval form. But six out of 75 species are pathogenic. Three species affect the stomach of the soliped (bots), two the skin of ruminants (warbles) and one the facial sinuses of sheep (grubs). The most practical way to deal with this insect is to interrupt its life cycle in the larval stage, although fighting the flies and killing their nits or preventing nits from being deposited is the strategy of attack, the best of which is the carbon disulfide treatment of bot infection developed by the late Maurice C. Hall, of the U. S. Bureau of Animal Industry. Shortly after the turn of the century, Perroncito, distinguished veterinarian of Italy, recommended carbon disulfide for that purpose until it was tested on a large scale by Hall and his coworkers of the Beltsville Research Station.

On the Expiration Date of Rabies Vaccine

Inactivated, chloroform-killed rabies vaccine stored for 4.5, 10.5, and 16.5 months, given to 32, 38, and 40 dogs, respectively in 5-cc. doses subcutaneously, produced in one month an immunity that resisted intramuscular injections of street virus in all but 2, 4, and 6 of the respective series, while 36, 41, and 39 untreated dogs all died from the experimental inoculation.

The conclusion was that chloroform-killed rabies vaccine stored for a year under refrigeration retains its antigenicity; but more important, from the practitioner's point of view, is that "It is evident from the three tests that in each instance a high degree of protection was afforded to the vaccinated dogs." [*Beach, Charles N., M. D., and Johnson, Harald N., M. D.: Effect of Prolonged Storage on the Antigenicity of Chloroform - Inactivated Canine Rabies Vaccine. American Journal of Public Health, 32, (Dec. 1942): 1380-1382.*]

In a study of the relations of brucellosis and periodic ophthalmia of horses, T. C. Jones, Major, V. C., U. S. Army (*The Army Veterinary Bulletin*, Oct. 1942), found, through cultural and serological tests, that Brucella organisms are not constant in cases of periodic ophthalmia.

Corncobs make excellent litter for the poultry house. Ground with the hammer mill, a large amount of litter material, as good as peat, can be obtained at little cost.

Dermatomycosis in a Dog Produced by Microsporum (Achorion) Gallinae

A laboratory dog, isolated for two months, presented a small scabby lesion on the head (fig. 1). The hair immediately surrounding the lesion had almost disappeared. The surface of the lesion beneath the scab, which was easily removed, was moist. It was evident that the lesion was not due to true suppuration.

Microscopic Examination.—Among the hairs isolated from the scab or lifted from the periphery of the lesion, numerous ones had the aspect of hair contaminated with a Trichophyton macrospore. The process was so advanced that most of the hairs had disappeared. Some of the hairs were surrounded with chains of large spores and others with mycelian filaments (figs. 2 and 3).

Fig. 1. Ringworm lesion on the forehead of a dog caused by Achorion gallinae.

Cultures.—In eight days the primary colonies incubated at 26 C. on sugar agar (4%) clouded the medium. Their diameters varied from 1 to 1.5 centimeters. The smallest at the thin part of the medium had a prominent center, while the larger ones, located at the bottom of the tube, already began to divide in sectors. The young colonies were as white as snow. On agar, after 8 to 10 days, the medium was colored red. The tint varied from rose to deep red. In 12 days the white colonies also became rose colored but the redness was never as deep as on sugared media. Cultures on agar-malt media gave the best results.

The macroscopic aspect of the cultures were those of *Trichophyton rosaceum* since the lesions of the skin and aspect of the infected hairs of the dog resembled those of a Trichophyton macrospore. As the cultures grew older, the pigment diffused around the colonies and colored them red, a remarkable peculiarity of *Achorion gallinae* that is not seen in cultures of *T. rosaceum*. The latter develops slowly and forms colonies like a powder puff, although the young cultures are flat. Microscopically, the author's cultures corresponded to those of *A. gallinae*.

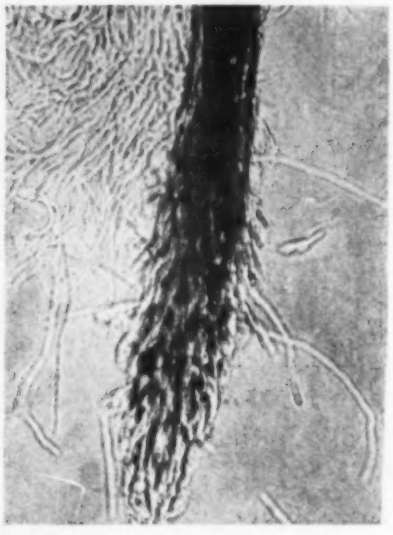

Fig. 2. Hair surrounded with chains of large spores of the parasite.

The important question was to know how this dog which had not been in contact with

other animals for several months became contaminated with this taenia, whereupon it was found that the dog had been housed

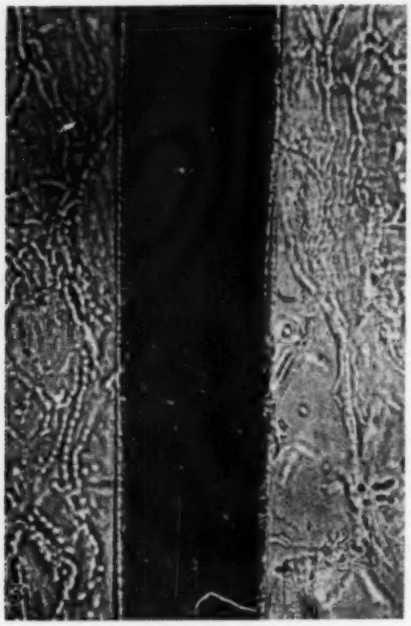

Fig. 3. Hair surrounded with filaments of the parasite.

for a time in a place occupied by chickens two months previously. Although no lesions had been noticed in the chickens, that fact does not exclude the possibility that one of them might have been affected with ringworm. Since there was no direct contact the case was, therefore, one of spontaneous infection of a dog with *A. gallinae*, cultures of which were infective for guinea pigs and chickens.

Insect Vector Demonstrated in 1881

On June 30, 1881, Carlos Juan Finlay, of Havana, demonstrated that the mosquito transmits yellow fever. He caught a mosquito and allowed it to fill itself with the blood of a man, one Camilo Anca, who was fatally ill from yellow fever, and two days later allowed it to sting another person, identified in the report as F. B. Twelve days later, F. B. fell ill with a mild attack of the disease. The experiment was published in *Anales de la Academia de Ciencies Medicas, Fisicus y Naturales de la Habana, 28,* (1881), p. 147.—*From Book News, Medical Times, December, 1942,* p. 439.

Thus, more than twenty years elapsed before Walter Reed set up the experiment which started a new era in yellow fever prophylaxis.

Mandibular Fracture in a Horse

In a head-on collision with the guy cable of an electric light pole, a runaway horse tore loose half of its mandible from the symphysis between the incisors back to the level of the first premolar. The segment lay in the mouth attached to only a thread of buccal tissue. Since injuries about the mouth heal well, and the lost teeth were concerned only in prehension, the owner was encouraged to treat the horse rather than kill him.

A mouth wash was prescribed, after removing the segment, and the horse turned into a pasture of long grass. It was soon recognized, however, that he could eat better from a manger, eating oats and hay only a little slower than normal. The horse did not lose a feed nor any flesh, and was soon back to work again.—*Chas. Haasjes, Shelby, Mich.*

Agar-Agar Substitute Developed

A substitute for Japanese agar-agar, termed "carragar," is now being produced on the site of the century-old Irish moss industry at Scituate, Massachusetts.

Carragar is not to be confused with the conventional Irish moss extract. It is a new type of extractive with many of the physical and chemical properties of agar-agar. Its development as a practical jellifying agent is the result of collaboration of the producer with authorities in the bacteriological and genetics fields.

Carragar is specifically designed to replace agar-agar, either in its entirety or in major part, in the many and varied uses to which agar is put in bacteriological and genetics laboratories. Government and university experts have tested its use broadly as the solidifying agent in plain, enriched

and special bacteriological mediums, as well as in genetics substrates. Its use is recommended in the routine preparation of pour plates for water and milk work, and for both semi-solid and deep-stab culture mediums. All organisms tested thus far have shown either as good or better growth on carragar mediums as on agar-agar controls.

The properties, characteristics and general performance of carragar in comparison with agar have been made the subject of a report based on original work in the bacteriological and genetics fields. A few copies of this report are on hand in the AVMA office or may be had by writing to the manufacturer, Carragheen Products Department, Krim-Ko Company, Scituate, Massachusetts.

Penatin and Penicillin

Penatin is the second germ-killing derivative extracted from the mold *Penicillium notatum*. The first *(see* The JOURNAL (Jan. 1942): 22) was discovered by Alexander Fleming, British scientist, in 1941. Penicillin was found to kill certain pathogenic organisms in unbelievably weak dilutions. Penatin, discovered by Dr. Walter Kocholaty, University of Pennsylvania, recently was proved to possess still higher microbicidal power and to have a wider range of application. Fifty pathogenic and nonpathogenic species yielded to its action in dilutions as high as 1 : 400,000,000. Anthrax, diphtheria, typhoid, paratyphoid, brucellosis, pneumonia and pus-forming microörgansms were killed with dilutions of 1 : 12,500,000. Since its action was not lowered in 90 per cent serum, there is reason for forecasting effectiveness in the living subject. No obvious ill effects were observed from large intravenous injections in rabbits and guinea pigs.

From the Mayo clinic comes a report of a case of a deadly staphylococcic infection, described as apparently hopeless, that yielded to an intravenous instillation of penicillin continued over a period of six days at the rate of 25 to 30 drops per minute. After the first 22 hours, the blood previously teeming with staphyloccoci was germ-free and the patient was on the road to recovery. Phenothiazole had failed to make any impression on the course of the disease.—*Abstracted from Science Digest.*

Anti-Venine Production in South Africa

A recent release from OWI tells of a unique contribution of the Union of South Africa to the fighting fronts of the United Nations by gathering of snake venom for antidotes. Previously, a chief source of supply was the Pasteur Institute of Paris.

Daily, three South African corporals patrol in ravines and along river banks hunting two of the world's deadliest snakes, the South African yellow cobra and the puff adder.

The cobra yields a poison which, acting upon the nervous system, kills in a few minutes while the bite of the puff adder causes virulent blood poisoning. The venom from these two killers is processed at the South African Institute of Medical Research, in Johannesburg, to form an antivenine serum.

"Cornstalk Diseases"

Without including the digestive upsets and fatal toxicoses farm animals of the Cornbelt contract when turned into the stalkfields, the practice has obviously taken tolls of greater significance in other ways not calculated in the total losses. A day or two in the newly shucked cornfield can upset the health of a dairy herd for weeks if not for a whole season. Delectable nubbins decrease the appetite for the kind of feed dairy cows need. This lowers the flow of milk, and as experienced dairy farmers know, they may not return to normal production for some time.

In regard to horses, turning them into the stalkfield until they have eaten every stalk bare is doubtful economy since the ration, though ample in quantity, is the antithesis of what horses require to maintain a state of health and vigor.

NUTRITION

MATERIAL FURNISHED BY THE COMMITTEE ON NUTRITION

The Role of Nutrition in Health and Disease

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THE WEALTH of this nation is based on agriculture; the health of its animals is founded on proper nutrition. Together with the nutritionist, the veterinarian is the authority for prescribing proper diets for all farm animals in health and disease.

In earlier years, meat animals were raised on natural foods, consisting largely of grass, hay, and cereal grains; they made slow gains and produced meat of ordinary quality. The same was true of dairy cows and chickens. Their diets were composed chiefly of products grown on the farm where the animals were fed. Cows gave less milk, and chickens laid fewer eggs. The 40,000-lb. dairy cow was unheard of, and a production average of 200 eggs per hen annually was a poultryman's dream.

The diets of farm animals today stand out in sharp contrast to this earlier picture. Corn and pasture no longer are accepted as an efficient hog diet; beef cattle make faster gains and produce finer beef on feeds supplementary to range grasses; the successful dairyman feeds his cows concentrates, instead of just pasturing them during the summer; the poultryman no longer thinks in terms of 20 lbs. of feed daily per 100 layers, but rather of the maximum total feed he can encourage them to consume, which, in many cases, approximates 40 lbs. per day, rather than 20.

These changes did not "just happen." Selective breeding brought superior purebred sires to several million dairymen, beef cattlemen, and hog raisers. The use of the trap nest brought similar improvements to poultrymen.

Notable improvements in management paralleled the advances made in breeding. Well-ventilated, sanitary, dairy barns, constructed for comfort in winter, were a great boon to milk production. Comfortable, dry quarters for brood sows and their offspring quickly returned a bonus. Warm winter quarters assisted materially in filling winter egg baskets.

Even greater improvements have been made in the field of animal nutrition. Because of increased knowledge of the requirements of dairy animals, modern nutrition played a leading part in producing the first 40,000-lb. cow; a 1,000-lb. steer may be ready for market in 400 days; the well-fed hog now goes to market in five and a half months; the farm flock, with its carefully formulated ration, produces eggs throughout the winter months.

In short, modern livestock feeding is the product of skilled research and proved feeding practices. However, high production and fast gains present new problems which demand modern treatment. It is the veterinarian's responsibility to keep abreast of the streamlined animal industry and assist the farmer in preventing nutritional deficiencies which are more apt to occur under modern, high-speed conditions.

WATER

Water is the first essential of adequate nutrition. Physiologists working with animals show that pathologic disturbances with morbid potentialities will result from

Presented at the seventy-ninth annual meeting of the American Veterinary Medical Association, Chicago, Aug. 24-27, 1942.

a loss of 10 per cent of the body moisture. The functions of water in body tissues are many, and include such basic metabolic duties as transferring dissolved nutrients to the cells and removing waste products therefrom, lubricating the body surfaces, and assisting in temperature regulation. The functions of, and associated with, reproduction are influenced greatly by water.

Like human beings, animals drink when they are thirsty; unlike human beings, they cannot ask for a drink, and often must wait for an opportunity to drink. Dairy cows wait because many farmers water their stock but once a day; hogs wait because the waterer is empty part of the time; chickens wait because often one container is the only source of water for several hundred birds. This waiting is costly!

A hog requires 550 lb. of water to produce 100 lb. of pork. A brood sow will consume more than 5 gal. of water daily during the period from one week before, to six weeks after farrowing. Within one hour, a hog has been observed to make 17 consecutive trips from feed to water early in the morning, before lying down.

One hundred heavy-breed, laying hens will consume nearly 10 tons of water in a year. During warm weather, turkeys will drink 5 lb. of water for each pound of feed consumed. A laying pullet has been observed to dip its beak into a waterer 57 consecutive times, following its breakfast at the mash hopper.

It has been shown that watering dairy cows twice daily produced 7 per cent more milk than watering them once a day. The use of automatic water fountains further increased the milk flow 4 per cent over watering twice daily. The dairyman's greatest interest in these data, aside from the bigger milk check, is that these increases were the result of increased water consumption only. The experimental animals received carefully measured quantities of concentrates and roughage, and these amounts were not increased during the water consumption trials.

Milk is approximately 88 per cent water. For many years the dairyman has wanted to know how legally to water his milk; increased water consumption provides the answer.

To assure maximum water consumption, the following points should be given careful consideration:

1) A water system that assures a plentiful supply at all times should be used.
2) Water should be neither ice cold in winter nor piping hot in summer.
3) Water containers should be placed within easy access of the animals, close to the feed containers, and, in warm weather, in the shade.
4) Two or more containers should be supplied if the herd or flock is large.

UNDERFEEDING

A maintenance ration must support many body processes, including heat production; control of body temperature; mastication, digestion, and assimilation of food; peristalsis; glandular secretions; respiration; circulation of the blood; necessary but nonproductive muscular activity; nerve impulse conduction and response; and the excretion of waste products.

In practical farm feeding, a maintenance ration is synonymous with underfeeding. The veterinarian should be quick to note yearling heifers or dry cows on poor pasture without supplementary feed, or growing pullets fed only corn and range grass, often of poor quality. The farmer should be advised of the danger to his profits from delaying productive maturity and increasing susceptibility to disease.

OVERFEEDING

Many animals will not overeat, even when an abundance of food is before them. Hogs, chickens, and turkeys are fed efficiently and safely by the cafeteria or self-feeder method. However, in ruminants, impaction and bloat may prove fatal when these animals are first offered succulent pasture. Overfeeding immediately following the expending of great amounts of energy is a dangerous practice. Some brood animals, particularly sows, are easily overfed immediately following parturition.

PROTEIN

Protein is the principal factor in repairing tissues and building new ones.

Crude protein is a term embracing all the nitrogenous compounds of plants, two great groups of which are known as proteins and amides. The proteins are complex compounds essential to all life, since they form the basis of the living protoplasm of animals and plants. The amides are more simple compounds and considered the building stones of proteins. In this group fall the 22 recognized essential amino acids, although not all of the 22 are essential to all animals.

The veterinarian need not know the chemical formula of complex proteins, but a knowledge of the quality and quantity of protein being fed is essential. Several fundamentals, then, should be kept in mind:

1) Usually, very young animals require higher levels of protein than adults.

2) Any feeding practice which encourages a quick, early rate of growth, is sound nutrition.

3) If the animal is to remain healthy and profitable, total protein intake must be adequate to maintain rate of growth, and support production.

4) If the sick animal is to recover, its diet must contain sufficient protein to repair tissues and give the animal strength.

5) Diets of sick animals must be easily digestible and readily assimilable.

6) Finally, many sick animals, especially chickens and turkeys, virtually starve to death, instead of dying from the disease itself.

Quality of protein is one measuring stick of feed efficiency. Quality includes digestibility and the content of essential amino acids.

CARBOHYDRATES

The sugars, starches and undigestible fibre make up the carbohydrate substances of the diet and are supplied by plants. The sugars and starches are the preferred body food for muscular energy. Fibre, in addition to yielding simple organic compounds, has the particular rôle of adding bulk to the ration, and is of special importance in maintaining normal peristalsis.

FATS

Fats are carriers of the essential vitamins A, D, E, and K, and in addition provide energy. Fat deposition gives gloss to the coat, provides warmth, and in meat producing animals portends quality and flavor.

MINERALS

Mineral salts are essential to all vital processes of the body, and they must be present in correct proportion, since a proper relationship or mineral balance must be maintained in the normal animal. If minerals are fed beyond requirements, the kidneys and the intestinal tract remove the excess from the bloodstream. A continuous imbalance of mineral matter in the ration may cause permanent injury to the animal.

As a rule, grains are low in minerals and roughages high. The one vital mineral not present in roughages in required amounts is salt, and this important ingredient must be supplied by the feeder.

It should be borne in mind that the mineral content of roughages depends upon the mineral content of the soil in a given locality. Thus, in some areas, iodine and cobalt should be added to the ration. A small amount of ground limestone will supply the necessary calcium; steamed bone meal is an excellent source of phosphorus; iodized salt furnishes sodium, chlorine and iodine; and, for chickens and turkeys, manganese, usually in the form of manganese sulfate, is necessary in very small quantities.

In hog feeding, particularly, the practice of adding large quantities of a mineral mixture has been shown to be unnecessary and expensive. The use of ground limestone, and in some cases, small amounts of steamed bone meal are usually all that is required. Often extravagant claims are made that mineral mixtures prevent or cure infectious hog diseases, but instead, the result may be a mineral imbalance causing more harm than good.

VITAMINS

Before modern biochemists unlocked the door of mystery behind which the composition of vitamins was securely closeted, these vital substances were defined as unknown essentials necessary to maintenance,

growth, health, and reproduction. Before that, compounding feed formulas consisted largely of "balancing rations" by including proper amounts of proteins, carbohydrates, fats, and mineral matter.

It is known now that vitamins are organic compounds — chemical substances with definite formulas, composed of carbon, hydrogen, oxygen, nitrogen, and possibly other elements.

A long list of vitamins or vitamin-like factors is recognized. Many of these are present in feedstuffs in amounts sufficient for ordinary animal feeding. However, some essential vitamins, such as A, D, and riboflavin, are found only in certain ingredients, and A and E are subject to deterioration under storage conditions.

When the measurement of some of the essential vitamins in feedstuffs became possible, the "balanced" formula, as it pertained to proteins, carbohydrates, fats and minerals, was shown to be incomplete. Vernacularly, formulas are now a dime a dozen, and fail to guarantee adequate nutrition unless their vitamin values fulfill the known requirements. A quick look at feed formulas recommended for a given species of animal by the 48 state colleges, reveals that seldom are any two exactly alike. All 48 are good, provided their ingredients are of high quality, that is, rich in the essential vitamins, in addition to proteins, carbohydrates, fats, and minerals. Quality of ingredients, then, particularly as measured by vitamin content, assumes first importance in compounding proper rations.

In a carefully controlled feeding experiment, pigs from the same litter were divided into two equal lots. Each lot received rations of exactly the same formula and general chemical analysis. At the end of the experiment (20 weeks), the pigs on one ration weighed an average of 51 lb. more than those on the other. The difference was due to the quality of ingredients. Each group received the same proportion of fish meal, but one lot was of high quality and the other low. Each received the same percentage of alfalfa meal, one high in vitamin A unitage, the other low. Both lots of alfalfa were of good, green color.

Similar tests have been conducted with chickens and turkeys, and recorded differences were equally significant.

The veterinarian, like the physician, no longer considers each vitamin specific in action, but considers them interlocking in maintaining health, growth, and productivity. Thus, no longer can it be said that vitamin A is a specific for eye troubles, C a specific for scurvy, nor D a specific for rickets. Not only are vitamins dependent upon each other for harmony of action, but it is well known that certain vitamins act in harmony with, or are complementary to, minerals. Rickets is the best example of this co-dependency; perosis, or slipped tendon, of chickens and turkeys may be another.

NUTRITION IN DISEASE

When disease strikes, one of the first symptoms noted is loss of appetite. In the past, too often, inappetence has been considered nature's manner of preventing the sick animal from eating. There are instances, of course, where it is advisable to withhold food for a few hours or perhaps one or two days. However, the veterinarian should make it clear to his client that if the sick animal is to recover, it must have nourishment, and every effort should be made to encourage eating and drinking.

Even in acute diseases, which run a natural course of a few days only, the food and water intake may be too low to permit the animal to respond to medical treatment. Further, after a crisis has been passed, the total food and water consumed largely determines the prognosis and recovery.

In some chronic infectious diseases, food intake may be below par over an extended period of time, unless outside means are employed to improve the appetite. Often, in such cases, animals exhibit symptoms of nutritional deficiencies, in addition to evidences of the infection. The diagnostician must be careful, therefore, to differentiate between cause and effect. The ration may have been adequate in every respect, but

the pathogenic disturbance was sufficient to prevent the animal from consuming an amount of food necessary to prevent symptoms of one or more nutritional deficiencies.

Bacteriological studies of fatal diseases of the newborn often yield organisms viewed as the cause of death, whereas the inadequate diet of the dam may have been the responsible factor.

Nutritional therapy is essential to the control and prevention of several common bovine diseases. There is considerable evidence to show that many cases of calf scours, and pneumonia in both calves and yearlings, are initiated by inadequate diets. The former is well illustrated by the fact that more cases of calf scours are seen during the winter months, when the herd's intake of vitamins A and D may be low.

The gravid uterus may expel its contents prematurely, when the vitamin intake is insufficient to support normal pregnancy.

Recent researches may provide practical means of preventing milk fever, as it has been disclosed that daily doses of one million rat units of vitamin D fed for a few weeks before parturition, prevented this disease. Further research in this field may see the bicycle pump finally depart from the veterinary instrument kit.

Even though mastitis is an infectious disease, and is not caused by high protein feeding, a controlled diet may extend the productive life of a dairy cow already infected. If a chronically infected udder is called upon to produce to its full inherited ability, an expensive flare-up of mastitis may occur. Left on a diet low in protein and rich in carbohydrates, such an animal might never experience an acute attack of mastitis, and prove reasonably profitable for several years.

Proper nutrition is as necessary during the dry period as during lactation, Special diets or "fitting rations" for dry cows have been designed to furnish essential materials to: (1) permit the cow to replace body losses, especially minerals, which went into the milk pail; (2) store up a reserve for the oncoming lactation; (3) aid in developing a normal fetus; and (4) assure normal parturition. These rations are necessarily low in protein, usually about 12 per cent, and furnish an abundance of carbohydrates and essential minerals. In some cases, irradiated yeast has been added to furnish vitamin D.

The mother hen taught her chicks how and what to eat. Mass artificial brooding, to be successful, involves the provision of every facility essential to prompt eating immediately upon the arrival of the chicks. These essentials include: covering the litter for the first few days of brooding; providing sufficient light to assist the chicks in finding feed and water; allowing a minimum of one-half square foot of floor space per chick; and providing a sufficient number of feeders and waterers.

An attack of cecal coccidiosis usually terminates in a few days. A nutritious diet, in addition to practical sanitation, is of the greatest importance in holding morbidity and mortality at low levels. The feeding of dried cheese whey (70% milk sugars), dried skimmilk, or dried buttermilk (50% milk sugars), usually produces a quick response in outbreaks of coccidiosis. These milk products should be fed limitedly, however, such as half-days alternately with the regular ration, while the disease is running its course.

When infectious bronchitis is encountered in chicks only a few days old, the feed should be moistened slightly and offered at intervals of one or two hours. Many times the disease strikes before the chicks have learned how to eat, and observations show that in such cases, the mortality may be unusually high.

The drop in egg production may be the greatest loss sustained when coryza attacks the laying flock. Wet mashes, liquid milk, dried cheese whey, and pelleted feeds high in protein will aid in avoiding such losses, and tend to shorten the course of the disease.

It has been shown that fewer embryonated eggs of the common intestinal roundworm of the chicken will hatch in the intestine of the fowl, when its diet is adequately supplied with vitamin A. Further,

many of the roundworm eggs that hatch fail to mature fully. These findings later may shed important light on ascariasis in other animals.

Recentlly, it was reported that raising the protein content of the diet from 13 per cent to 26 per cent resulted in tapeworm-infested pullets making approximately the same gains as the noninfested controls. While the practicability of such a ration may be questioned, another step has been taken toward the solution of this troublesome parasite problem.

Figures recently released by the United States Department of Agriculture show that 34.7 per cent of the nation's annual pig crop fails to get to market. It is estimated that more than half of these losses can be prevented by adequate nutrition and management.

In the Middlewest, hypoglycemia in newborn pigs, or baby-pig disease is currently a serious menace both to the farmers' profits and to the war effort. In some cases, entire litters have succumbed a few days following farrowing. There is growing evidence that this disease, first thought to be an infection, may be partially or materially prevented by providing adequate nutrition to the pregnant sow.

Although in necrotic enteritis, reducing the amount of protein in the ration of the affected herd is common, in many cases, this arbitrary practice may delay recovery. On the other hand, there is some evidence that the substitution of an equally nutritious diet composed of easily digestible ingredients such as milk by-products, aids in the recovery from this disease.

Protein Poisoning

Feeds do not kill. Biochemists, pathologists, and state feed chemists offer ample proof of this statement. Experiment stations have demonstrated conclusively that there is no such disease as "protein poisoning."

Rats have grown normally, in so far as can be determined, on a daily diet containing 90 per cent protein.

Dairy cows have been fed successfully for long periods of time (as during their entire lactation period) on cottonseed meal with a protein content of 40 per cent as the only concentrate, when this was supplemented adequately with proper vitamins and minerals.

Men have lived on an exclusive meat diet, with a minimum of fat, for eleven consecutive months with no detectable disturbances in their health. Eskimos live almost entirely on fish and animal products throughout their normal life span.

Pigs have been fed for thirteen consecutive weeks on a diet containing 42 per cent protein. This is three times as much protein as that normally fed to growing pigs. Each pig gained 1.34 lb. daily, made a 100 lb. gain from each 378 lb. of feed consumed, and exhibited no evidence of disease. The only visible evidence of abnormality was a scouring, which had no detrimental effect as measured by gains in weight, clinical manifestations and exhaustive autopsy examination of vital tissues both macroscopically and microscopically.

Nutrition Committee Formed

Recently, the American Veterinary Medical Association established a Committee on Nutrition. This urgently needed step betokens important progress in providing more adequate veterinary service to the livestock industry.

In the final analysis, the control of all animal disease is a veterinary responsibility. To fulfill his professional obligation, the veterinarian must be possessed of certain fundamentals of nutrition and sound feeding practices. All his technical training in pathology and classical skill in clinical medicine will avail him but little over a period of time, unless nutrition receives from him attention equal to that given infections.

After you've been in line with your ration card two or more hours a day only to find there's nothing left when you finally get to the counter, you'll have a better idea of just what rationing can mean in a hungry world.

EDITORIAL

A New French Veterinary Journal

Though France of 1943 defies political analysis, the spirit and the foresight of its people who started a system of formal veterinary education and a veterinary profession in 1761, has not declined despite social upheavals of unprecedented magnitude—witness the sprouting of a new journal in Equatorial French Africa. To the regret of all men connected with the fields of veterinary education, research and practice, the French scientific periodicals devoted thereto have been suppressed since June, 1940. At least, they ceased to arrive in the AVMA office and our exchange copies were stopped at Stockholm stamped *livraison defendu* (delivery forbidden). It was, therefore, gratifying to learn that the veterinarians on duty in the remnants of the French empire started anew as soon as hope of survival came with the arrival of American troops. Quoting from a note dated Dec. 9, 1942:

> Since 1940, we ceased to receive the veterinary journals which had been published in France. Although the veterinary schools reopened in September, 1940, it was feared that most of the journals ceased publication on account of material difficulties.
>
> A group of physicians, pharmacists and veterinarians in Equatorial West Africa, one of the first colonies to rally to the cause of the United Nations, undertook the publication of *Revue des Sciences Méâicales et Vétérinaires.* The first number to arrive is well presented. It contains 112 pages of text and, in particular, two articles of veterinary interest: one by M. Malbrant on pseudo fowl pest in Middle Congo and another by J. E. Wéry on the polymorphism of copper sulfate poisoning.

The influence French veterinary literature has had upon the advancement of our branch of medicine throughout the world has been quite generally overlooked in this country. Dismissing the classical books of the preveterinary school period and even the school work of the founders of our system of education, the world's veterinarians of 1942 are still governed by the brilliant teachings of Devaine, Toussaint, Villeman, Pasteur,* Nocard, Chaveau, Neumann, their colleagues and successors, Railliet, Barrier, Goubaux, Leclainche, Vallée, Cadeau, Dechambre, Guérin, Panisset, Bourdelle, Ramon, and others, who should be included among those who shaped the destiny of veterinary science in the civilized world. One scans veterinary history in vain for a country that has accomplished as much. Although the language obstacle may seem to have dimmed the fame of French veterinarians and their literature, their work nevertheless asserted itself as something fine and sound and scientific and continuous. The veterinary journals of France, for over a hundred years up to June, 1940, were the world's mediums wherein the "veterinary news" of all nations and all languages were gathered and published. French, the onetime official language of all nations, was precisely that for veterinary science.

American veterinarians are reminded that through the formative years of our veterinary service, the "European Chronicles" came to them monthly in the *American Veterinary Review*, now the *Journal of the American Veterinary Medical Association.* These were translated and abridged by Editor Alexander Liautard, graduate of one of the French veterinary colleges (Toulouse), who for years brought the latest word in veterinary science to the English-speaking American nation. During the confusing days of striving to put animal-

*Not a veterinarian but an incessant coworker of the veterinary faculties.

disease control in order for a rather unreceptive population, what the writings of Liautard were accomplishing was never weighed. Yet, there they are from 1877 on, for any one to read and to judge.

Starting a veterinary journal in the jungle country of Africa where this same France is fighting, unafraid, with its back to the wall, is but the expression of the spirit of the 1760's which gave the world a profession of college-trained men delegated to watch over the domestic fauna brought into being *per se* some 12,000 years ago on the very ground where the first veterinary college was founded.

As Editor Morris Fishbein* of the American Medical Association says of the effect of the war on medicine: "With sadness one contemplates the destruction of all that is great of the medicine of Germany and Austria, the devastation of the medicine of France, and the starvation of the medicine of Italy and even the medicine of England. Yet, the very situation gives to scientific medicine in the United States and all of the American nations an opportunity for progress beyond anything that has ever been available before."

This *point d'approche* applies in all respects to veterinary science and imposes the same responsibility upon the veterinary profession in the United States, hopeful though that our fate will be less severe—that our workshop will not have to retreat to the jungles to carry on, while the folk at home are leading the life of the desperate.

In the customary pastime of throwing mud at one another in these days of mental imbalance, the milk shortage is blamed on everything but the right cause. The swing of hired hands to the armed forces and war industries is alleged cause No. 1. Cause No. 2 is the farmers' swing from dairy cows to beef cattle. Figures are invoked to prove these two. Milwaukee packing plants received 5,179 more head of she stuff in October, 1942, than in the same month of 1941, and a survey in one Ohio county showed that the outlook for farm hands of 20 to 29 years of age is 27 per cent below par. Rural districts lost 1,600,000 men under 40 to the war effort and will lose almost that many more this spring. How many of these are town folk is not stated. Everybody in "rural districts" does not labor on the land. Many are of industry and business. So these figures in getting at the cause of milk shortage need revision.

One farm paper, after charging all this to "bungling bureauocracy", unconsciously lets the cat out of the bag in saying that there are more cows in the United States now and there was more milk produced in 1942, than ever before. How come? Milk cows, says *Hoard's Dairyman* (Dec. 10, 1942), bring $25 to $75 more per head than they bring for slaughtering, which would appear to mean that someone ought to tell the dairy farmers where to sell the cows they want to get rid of because their hired hand is carrying a musket or working at the munitions plant. The truth is, says a Wisconsin veterinarian in a congested dairy district, that while Milwaukee butchers were receiving so many dairy cows to slaughter, his county was producing more milk than at any time in its history, which goes back beyond the days of Uncle Jerry Rusk. Cause: Farmers are getting rid of "boarders," and keeping their profitable milkers with a tenacity never before known to him and are ever ready to buy more of the right sort. "It doesn't pay to keep boarders," is an old saying of dairyland. But, we never hear the politicians say a word about brucellosis, mastitis, sterility, puny udders, three teaters, and other things which ought to glut the stockyards with still more she stuff and to the country's advantage. In short, in all this swivel chair raving over food production, the limiting factor—animal health—is never mentioned. Did you ever see a fine, fair-to-good Holstein-Friesian, Guernsey or Jersey cow offered for sale at a central market that was not snapped up in a jiffy by the ever watchful cow dealers?

The claim *(Farm Journal,* Dec. 1942), that 20,000 farms are about to be abandoned this spring and that New England and New York dairy farmers are going to

*Fishbein, Morris: "Inter-American Medical Relationships," J.A.M.A., *120,* (Dec. 12, 1942), pp. 1186-1187.

sell 35,000 cows looks like pure guess work used to no good purpose. As a popular radio commentator says every night, "What do you think?"

"Dean Jacob"

The following is a reprint of an editorial in the *Chattanooga* (Tenn.) *News*, March 29, 1943. It is reproduced here to strengthen our memory of the life of a departed colleague who left the kind of heritage to his state, country, and profession that time does not efface:

Agriculture in Tennessee and the South lost one of its truest friends last week with the death at Knoxville of M. Jacob, dean of the University of Tennessee's College of Agriculture. Dean Jacob, Pennsylvanian by birth, came to Tennessee more than forty years ago and had contributed unsparingly of his time for nearly half a century to helping farmers and farmers' sons with their problems. He died at the age of 63. The Knoxville *News-Sentinel* paid this editorial tribute following the death of Dr. Jacob:

"There are many people—from the farmers busy with spring plowing to the businessmen who enjoyed sitting at the Rotary luncheon table with him—who feel a real loss in his death. A busy and useful citizen, he had ranked at the top in his profession. In his human relationships he showed a fine capacity for friendship. His work lives after him."

The human relationships of a college instructor or dean are always a most important factor in determining whether or not the individual is successful in his work. And Dr. Jacob, in his years of service at the University, touched the lives of thousands of young men who now are farmers and farm leaders in Hamilton County and other counties of Tennessee and the South. As they continue to perform effective service for agriculture, the ambitions of Dr. Jacob continue to be realized.

Hamilton County farmers have opportunity to judge for themselves the effectiveness of training provided under the guidance of Dr. Jacob. Of the staff of four farm agents here only one is from another university and even he has had numerous contacts with the friendly, helpful dean and, with the other members of the staff here, shares the dean's ideals for a balanced agricultural program operated on a profitable, businesslike basis.

The nation of 1943, anno Domini, that is unable to mobilize all of its resources for military purposes is apt to go down in defeat.

Meddling in Politics

Obviously fired by righteous indigation and no lack of good intentions, a member writes: "Among the veterinary journals of various countries which I read, ours is the only one that meddles in politics." Thanks a lot for a theme! Nothing said about the JOURNAL could be more truthful nor more complimentary, for in a real democracy, of which the world of '43 has none too many, a professional periodical worth the price of its paper stock has no greater duty than to meddle and meddle and meddle in the political questions affecting the life and work of the profession it is delegated to represent. Goodness man, that's why it is published, and happily, Americans are free to meddle unmuzzled. Freedom of the press is a sacred thing, and the most powerful of human efforts ever since the Pharaonic hieroglyphics were chiselled on stone or written on papyrus. Is ours the only profession that should not invoke that power in its behalf? Who will speak for us if we do not speak for ourselves? There is no gestapo to obey, no firing squad to fear, and there is the work of a useful group (yours) to keep in order and protect against usurpation. We are the child of politics and only politics can handle our diseases—heal our wounds, keep us healthy, and ward off the fatal affections to which a vocation like ours is constantly exposed. So, the notion that the JOURNAL should not *meddle in politics* is like bidding the sick not to call in the doctor. Perhaps, we are not in agreement on the definition of *politics*—the fine fetish of good government *versus* the sordid party bitterness on which our correspondent seems to dote and of which we are not even thinking about.

Are we yet to learn the difference between the *narrow sphere of a science* and *the broad sphere of its application?* Science for its own sake is one thing, science applied for the sake of mankind is something else—the something else the JOURNAL is expected to promulgate in understandable words.

It should not be necessary to remind veterinarians that journals in these two fields have their proper place, and that the

one does not discount the other. Only the one trespassing unreasonably into the other's sphere is culpable. Moreover, the official journal of an association like the AVMA has a chronological story of the veterinary profession to write, a journal of science and knowledge within its own sphere to put on record. Science is our dignity, its application our power. If a veterinary journal having no particular obligation wants to don the illusionary halo of science that is its privilege. The press is free and science is grandiose. But, when politics blocks scientific usage, the country for which its journal speaks looks to it for guidance.

To attain optimum usefulness, a profession in a democracy defends itself through politics. The idea that science is something too divine to be akin to politics in the march of man lives only through over-rated affectation. To what extent the halo of science blocks the advancement of clinical medicine is something to ponder. The fearless use of politics (in its true sense) was the making of our medical profession, thanks to the outspoken *Journal of the American Medical Association* which never lacked "what it takes" to push forward. It is beyond academic dispute that politics is none else but *you*. So, by all means and tokens, let us quit this childish quibbling about the make-believe sanctuary called science and the man-made iniquities of politics. The quibble doesn't make sense to the average mind.

A Glimpse Into Crucified France

A letter from a friend in France, identifiable but unsigned, has just arrived *via* Algeria, to which place it was somehow spirited through the censors of Fuehrer Schickelgruber. It is written with caution, as if to escape the wrath of the Gestapo, and was mailed at some distance from the writer's home to cover its tracks. It is a tale of distress, gnawing grief, sorrow, and wretchedness which beggars analysis in this period of world's history—a warning to American colleagues to watch their step, or else.

With all interurban travel forbidden and intramural transportation practically suspended for the embittered population, social intercourse has ceased to exist as hunger stalks in every French home and disease from malnutrition goes on taking its toll among men, women, children, and animals. "One needs not wonder why all the cats have disappeared," this writer says, "nor why horses are emaciated ghosts of their former selves, and the ill-fed calves can no longer be called food, even if obtainable in the 'black markets.'"

Everything and everyone is rationed. Housewives, rich and poor, stand in line for hours to get their ration book and again at the markets to get the pitiful amounts the book provides. One half of a woman's time is spent each day gathering the meager allowances which amount to less than 1 lb. of total food per day per adult person. The food, as of January, 1943, which the *outre Rhine* species of the genus Homo is allowing the French people to eat for one month is:

Coffee substitute	240 Gm. (8 oz.)
Sugar	1 kg. (2.2 lb.)
Cheese	420 Gm. (14 oz.)
Macaroni	450 Gm. (15 oz.)
Oleo	210 Gm. (7 oz.)
Potatoes	1.5 kg. (3⅓ lb.)
Bread	6.5 kg. (15 lb.)
Edible oils	660 Gm. (22 oz.)
Meat	75 Gm. (2½ oz.)
Confiture (jam)	120 Gm. (4 oz.)
Eggs	one
Wine	4 bottles (qt.)
Dried vegetables	6.5 kg. (15 lb.)

Those who work in the munition factories, agrarians who are able to hoard a bit of extra food, and those well enough off to patronize the German-managed black markets, fare better than the average person, this correspondent declares. Butter and milk and milk products other than cheese are not listed and inasmuch as the items and the amounts correspond to published reports, the letter has the earmark of unexaggerated fact—fact unbelievable in this day and age.

The wrath of a blatant, half-human Teutonic maniac has mesmerized the people of Germany into a state of brutality that words must forever fail to depict, and yet the unity of effort required to ward our

shores against the same visitation does not seem to exist in the upper bracket of our social circle, and *laissez faire* is by no means abolished among our common people. "What do you think?"

The Killing of Dairy Cows En Masse Political Jargon

The JOURNAL has on several occasions discounted the rumors that farmers all over the country are selling their dairy herds on account of this and that, mainly (the most convincing) the drafting of farm boys by the selective service boards. It is, therefore, gratifying to have the personal views on the subject of veterinarians located in congested dairy cattle districts to the effect that dairy farmers are buying, not selling, good cows and moreover that cows sold for butchering are the kind of low producers they do not want.

The slaughtering of she-stuff (under federal inspection) during the past twenty-two years, according to the United States Bureau of Home Economics quoted by *Certified Milk*, was as follows:—

YEAR	THOUSANDS*	THOUSANDS†	RATIO
			Per cent
1920	42,383	4,082	9.6
1921	41,805	3,220	7.7
1922	41,816	3,819	9.1
1923	41,998	4,392	10.5
1924	42,064	4,747	11.3
1925	41,164	5,055	12.3
1926	39,697	5,065	12.8
1927	38,455	4,684	12.2
1928	37,923	4,291	11.3
1929	38,591	3,942	10.2
1930	39,844	3,623	9.1
1931	41,606	3,380	8.1
1932	43,468	3,211	7.4
1933	45,946	3,812	8.3
1934	48,647	4,838	9.9
1935	45,590	5,412	11.9
1936	44,509	5,727	12.9
1937	43,459	5,626	12.9
1938	42,542	4,861	11.4
1939	42,767	4,446	10.4
1940	44,426	4,481	10.1
1941	46,135	4,992	10.8
1942	48,077	5,500	11.4

*Cows and heifers over 1 year, January 1.
†Cow and heifer slaughter under Federal inspection.

The figures include cows and heifers over 1 year old. Those for 1942, although incomplete and higher than for the preceding year, are still below the years of peak prosperity in the 1920's and 1930's. Moreover, as stated by *Certified Milk*, "Although the slaughter of cows is running substantially ahead of last year, the situation is not serious in view of the high level of cattle numbers."

What the Veterinary Profession Can Do If Called Upon

J. F. D. Tutt (*The Veterinary Record*, March 28, 1942) calls attention to the fact that in the frantic effort to augment food production in Great Britain, "The prevention of disease has been overlooked by every political speaker," or in other words, emphasizes the prevailing contention of the veterinary profession in this country. While our government officials, obviously more far-seeing than the general population, has charged the organized profession with the duty of procurement and assignment of personnel, there is still lacking a wholesome appreciation of the part animal diseases—war or no war—play in cutting down the food supply. Until that appreciation becomes known to every man, woman and child, shortage of things to eat will come to pass just as fast as the all-out program of national defense develops. The American people have yet to learn—as Britain now knows—that animal industry is a nation's greatest asset—in war its only hope. And to be remembered is the fact that animal industry without a disciplined veterinary service is "not much good."

Our veterinary personnel is organized but it is only marking time, waiting to be regimented for action against one of the country's enemies, that the public does not seem to see. G. Mayall (*ibid.*) adds: "It is no use to fiddle about with bits and pieces, here and there; a comprehensive scheme should be inaugurated to deal with the whole matter [health of animals]. . . . The ignorance of the general public as to the duties and responsibilities of the veterinary surgeon is appalling."

CURRENT LITERATURE

ABSTRACTS

Bovine Encephalomyelitis

Studies were made to determine whether or not the causal agent of the disease, an infectious encephalomyelitis, was filterable. Of 34 filtration trials using diluted and undiluted infected egg yolk material and embryonic fluids, and suspensions of infectious tissues and exudates with Berkfeld N or V candles, 15 were found infective for calves, guinea pigs, or chick embryos. Filtration pressures from 70 to 635 m.m. Hg, reaction adjustments from pH 6.5 to pH 8.3, and the use of physiological saline, M/15 phosphate buffer, and Hartley's broth as diluents gave no increase in yield of agent in filtrates. Assays in chick embryos indicated an almost complete loss of agent during filtration. Unfiltered infected egg yolk and embryonic fluids killed embryos in dilutions as high as 1 : 1,000,000,000. The addition of suspensions of liver and spleen from normal guinea pigs to filtrates containing the agent increased the possibility of infecting guinea pigs. An addendum states later work revealed very small, coccus-like bodies in and about the cells of certain tissues that may prove to be the active agent. [*T. W. Stearns and S. H. McNutt: Sporadic Bovine Encephalomyelitis: Filtration of the Causal Agent. Am. J. Vet. Res., 3, (July 1942): 253-257.*]

The Diagnosis of Brucellosis (Human)

The usual acute form of brucellosis is ushered in with high, usually persistent fever and profuse perspiration, malaise resembling severe influenza, and a remarkably clear head despite the severity of these symptoms. History of drinking raw cow's milk, or other exposure, the agglutination test, blood culture, and relative leucopenia confirm the diagnosis.

In the chronic form, the main criterion is the really sick patient of long duration, with remissions of good health interspersed with periods of vague illness. Fever may be absent and when present it should be checked against the blood count which tends to show a relative lymphocytosis, leucopenia, anemia, and high color index. An opsonocytophagic index described, like the agglutination test, is significant but does not furnish definite evidence. The former is the most useful. The proof is the presence of Brucella in the blood. Of the objective tests, the intradermal is the best. Favorable response to vaccine therapy is also diagnostic. Diagnosis emerges a combination of data.—[*Abst. J.A.M.A. (Jan. 23, 1943), from J. G. Griggs: Criteria in the Diagnosis of Brucellosis, Northwest Medicine, 41, (Nov. 1942): 389.*]

Mushrooms

Although mushrooms may not deserve to be called "vegetable beefsteak", as some are wont to do, the Massachusetts Agricultural Experiment Station have shown in a study of *Agaricus campestris*, a cultivated species, that it contains sufficient protective protein to keep rats alive and growing for six weeks. While mushroom protein, like gliadin of wheat and hordein of barley, is not a complete one, it is one of the best sources of the vitamin B complex, and a serving of 3½ ounces daily for adults supplies about one-fifth of the daily requirement of riboflavin and one-third of the daily requirement of niacin, besides appreciable amounts of thiamin, ascorbic acid, and vitamin K. Mushrooms are, therefore, more than just a flavor for food. They possess a definite food value, at least, so far as the species studied is concerned. [*F. C. Anderson and C. R. Fellers: Mushrooms Supply Food as Well as Flavor, Science News Letter, 43, (Feb. 13, 1943): 103.*]

Mad Itch in Swine (Aujeszky's Disease)

The term "mad itch" in swine is a misnomer, inasmuch as hogs infected with the virus of that disease have no pruritus at the point of infection as do cattle, sheep, dogs, and laboratory animals. An outbreak on a Missouri farm, investigated in 1940, concerned a herd of 190 head of which 74 had died when specimens were sent to the laboratory for study. Bacteriological studies were negative, but rabbits inoculated with the brain substance of an affected pig developed nervous symptoms on the third day and gnawing at the site of injection. Later, the rabbits were seized with convulsions and died. The skin at the site was hairless, congested, lacerated, and bleeding. About the same chain of events occurred in laboratory mice. The brains of the laboratory-infected animals brought the same results as the pig-brain material. A diagnosis of pseudorabies (mad itch) was made, as the action of the virus

was the same as that obtained in previous investigations of mad itch in cattle. The findings clearly confirmed those of Koves and Hirt (1934), and of J. Koves (1935) in Hungary, and that of Shope (1936) in this country.

Mad itch in swine differs from that of other animals, also, in the high morbidity (30 to 80% and higher) and comparatively low mortality, which is contrary to the rule in cattle. Although most pigs recover, there was an outbreak in Europe where the loss reported was 39 per cent in a herd of 80 young pigs and 95 per cent in another herd of 39, due, obviously, to highly virulent virus. Ordinarily, the loss does not exceed 5 per cent. [*Ray, J. D.: Pseudorabies in Suckling Pigs in the United States. Vet. Med. 38, (May, 1943): 178-179.*]

The Hog-Feeding Method of Garbage Disposal

Garbage disposal being one of the difficult problems of municipal administration, many American cities have adopted the hog-feeding method. The feeding of garbage to hogs was encouraged during World War I, and similar efforts are being made for the present emergency. While the effort, as such, is in order, the public health feature should not be ignored. Since the author has surveyed the situation, he deems it apropos to summarize the data accumulated. The feeding of uncooked garbage to swine appears to have made the incidence of trichinosis in the United States the highest in the world. Out of 5,379 persons examined by the National Institute of Health, 15.9 per cent were positive for *Trichinella spiralis*, although a certain percentage may not have had a recognizable attack of the disease at the time of its occurrence. The United States Health Service receives reports of about 400 cases annually, in approximately two-thirds of the states. Perhaps, many cases are not properly diagnosed.

In nearly 600 composite 100-Gm. samples of pork scraps, one-third of which were cooked, 1.5 per cent harbored the parasite, and the percentage seemed to be correlated with the type of food the animals had been fed. The United States Bureau of Animal Industry found an incidence of 0.8 per cent in 12,000 grain-fed hogs, and 6.2 per cent in garbage-fed hogs. The incidence for hogs fed on cooked garbage was 0.4 per cent. Kerr's report on the trichinosis problem in California gives the percentage as 6.4 in 1,704 hogs fed uncooked garbage, 0.6 for 1,109 grain-fed hogs that received some kitchen scraps, and 0.4 for 2,436 hogs fed exclusively on grain.

The data collected have shown that rats play but a minor rôle in the transmission of trichinosis, inasmuch as cooking the garbage has no bearing on the rat population around a garbage-feeding plant, and moreover, out of 403 cities, in only 24 was garbage cooked before feeding it to hogs. There appear to be around 1,250,000 hogs fed on garbage annually in the United States.

During the past ten to fifteen years, the food value of garbage has decreased, obviously, because of more extensive use of refrigeration and economies of housewives. The decrease in food value likewise decreased the profits of garbage feeding, and, therefore, increased the financial hazard. Garbage-fed hogs are not popular with meat packers. The pork is soft and oily, the carcasses dress below normal, and the finished products (lard and pork) are of inferior quality.

The cost of garbage ranges from less than nothing (in cities which pay for having it collected) to as high as $6.00 a ton where there is rivalry among the feeders and, besides, garbage-fed hogs have other diseases (hog cholera, swine erysipelas, tuberculosis, vesicular exanthema).

Whereas, cooking the garbage would not solve the trichinosis problem, it would contribute to its control in the human being, since the frequent warnings to cook pork well have not been successful. The situation warrants the use of control measures. There have been few human cases of trichinosis in Canada and England where the cooking of garbage is employed as a protective measure.

The objection to the cooking of garbage on the grounds that it lowers palatability is not valid. Hogs consume cooked garbage with relish, and the claim that cooking releases danderous alkalies lacks supporting evidence. Citrus fruit rinds are not rendered toxic, although they have but little food value.

After describing methods of processing garbage for hog feeding (with four graphic illustrations of cooking plants), the author concludes that the prevailing practice of municipal garbage disposal by feeding it to swine is a means of spreading trichinosis to man and a potential hazard for the spread of endemic typhus and plague. [*Willard H. Wright, D.V.M., Ph.D., F.A.P.H.A., Chief, Division of Zoölogy, National Institute of Health, Bethesda, Md. Am. J Pub. Health, 33 (Mar. 1943): 208-220.*]

Fluorine Content of Plants and Commercial Fertilizers

Whether livestock will suffer ill effects from the feeding of forage grown on land fertilized with fluorine-bearing fertilizers is answered in the negative through studies made at the University of Tennessee and Tennessee Valley Authority. Calcium chloride, the form into which fluorides pass quickly in the soil of humid

regions, did not toxify sweet clover, red clover, nor Sudan grass. A wide range of safety was proved by attempting to increase the uptake of fluorides in various ways, and there was no ill effect on either germination or plant growth. The results, described, illustrated, and tabulated, lead to the conclusion that no harmful enhancement of fluorides need be feared from fertilizing land with fluorine-bearing fertilizers and liming materials. [*W. H. MacIntyre and S. H. Winterberg, University of Tennessee, and J. G. Thompson and B. W. Hatcher, Tennessee Valley Authority, Industrial and Engineering Chemistry, 34, (Dec. 1942):1469-1479.*

Studies on Johne's Disease

In order to determine the most effective method of sensitization to johnin of guinea pigs destined for the standardization of this product by the intracutaneous method, Johne's bacillus was introduced into the animals by five different routes: intraperitoneal, subcutaneous, intradermal, intracardial and *per os*. The intraperitoneal route was found to be the most effective in producing a pronounced skin sensitivity to johnin in the treated guinea pigs. The degree of sensitization by the intraperitoneal application of the Johne's bacilli was enhanced and more durable when the organisms were suspended in a vehicle containing 50 to 75 per cent mineral oil or when the peritoneum of the animals was treated with a suspension of Ca-phosfate forty-eight hours prior to the intraperitoneal injection of the Johne's bacilli in physiological saline, slightly modified by the addition of some Sauton's synthetic medium. Fewer complications occurred in the experimental animals after the use of the Ca-phosfate method, and for this reason it is held to be superior to the injection of mineral oil suspensions of Johne's bacilli. The Ca-phosfate suspension is prepared by mixing sterile 5 per cent solutions of CaCl (6 H_2O) and Na_2HPO_4(12 H_2O) in a ratio of 1 to 4. The resulting precipitate is equally suspended by thorough shaking and 2.5 cc. are injected per animal. A sensitizing dose of 15 mg. of Johne's bacilli is sufficient to obtain as allergic response an area reaction of well over 16 mm. diameter in the period between the second and eighth week after sensitization. [*H. Konst and E. A. Watson: Studies on Johne's Disease; Reactions to Johnin in Sensitized Guinea Pigs. Am. J. Vet. Res., 4 (Jan. 1943): 34-44.*]

Nutritional Status of Britain

The food situation of Great Britain is now on a reasonably satisfactory basis. Necessities are being eaten in ample amounts and luxuries have been eliminated. The growing of more vegetables (carrots, cabbage, greens) has been a factor, together with making use of every acre of arable land. Imported food is wisely rationed. Cows and chickens receive priority ratings because of their protein-converting power. Children of the poorer classes are better nourished than before the war, though there is some anxiety over the supply of vitamin C as shown in studies of boys in schools and colleges by means of the so-called saturation test. A more even distribution of niacin to prevent gingivostomatitis (trench mouth), some cases of which have been seen among children in London, is advised. With this exception (niacin), the nutritive status of Britain is satisfactory under the circumstances. [*Nutrition Reviews, 1, (Feb. 1943):112-115.*]

On the Sex Ratio in Cattle

In order to insure a complete random sampling of cattle births in a study of sex ratio in cattle, more than 200 dairy cattle farmers were invited to coöperate in the investigation by preparing and sending to the Maine Agricultural Experiment Station a sheet showing the date, name of the bull and cow, and other pertinent information for each service performed in their dairy herds. When a birth occurred following a service, a similar sheet was prepared showing the date and sex of the birth. The service and birth sheets were brought together at the Station, each service sheet being traced to show a resulting birth, an unsuccessful service, or that the cow was slaughtered before the birth of the fetus.

The tabulation of these records shows that in 3,559 births there were 1,799 males and 1,760 females. This ratio of 50.5 per cent males and 49.5 per cent females indicates that the distribution of sexes in cattle families is essentially at random in most instances.

There are cattle breeders who feel that sires differ in their ability to produce one sex or the other in their progeny, in a manner comparable to the differences which have been demonstrated for rats or Drosophila. In their opinion, certain bulls are female-producing, whereas other bulls tend to produce male progeny. A breaking down of the above data to show the distribution of sexes in the progeny of different sires and the distribution in the progeny of different dams leads to the view that, within these data, there are no sires which tend to produce either male or female progeny in excess.

By studying the data from the viewpoint of the effect of the age of sire or dam on the sex ratio of its progeny, the author concludes that the age of the sire or dam does not materially affect the sex of its progeny. [*J. W. Gaven: On the Sex Ratio of Cattle. J. Hered., 33, (Aug. 1942): 299-301.*]

Local Analgesia for Sprains

The cause of pain has never been explained, but for clinical purposes it is sufficient to account for the injury and the resulting pain. In the common sprain, this is due primarily to the partial rupture of some of the ligaments and smaller blood vessels, with the formation of an hematoma which is usually composed of more tissue fluid than actual blood. The tension exerted by this fluid within a confined space probably produces most of the pain and loss of function. The ensuing stiffness is due in part to this fluid accumulation and in part to the disuse caused by the pain on motion. Theoretically, if mechanical pressure in the form of gentle massage were possible, drainage could be promoted, the effusion decreased, and subsequently the pain would disappear and motion return.

The *modus operandi* recommended by the author is as follows: The area for injection is washed with soap and water, and iodine and alcohol applied. A ¾-in. hypodermic needle of suitable gauge, attached to a 2-cc. syringe, is inserted directly into the most tender area of the lesion. As much as is possible, all the infiltration is performed through this one skin puncture, checking the tender areas by pressure from above, changing the position of the needle below the skin. As most sprains take place in areas where there is a large vascular network, it is important to keep drawing back on the barrel of the syringe to guard against injection into the general circulation.

This procedure is contraindicated in 1) an open wound, 2) an infected or potentially infected area at or near the site of the injured area, 3) the rupture of a large or medium-sized vessel, and 4) idiosyncracy to the drug.

The drug used in this work was a 2 per cent procaine hydrochloride solution in distilled water. The amount of solution to be injected is the amount necessary to produce complete local anesthesia.

In the three cases reported by the author, motion was restored to affected joints while the swellings were still present, sometimes immediately after injection. The use of the joints acts to hasten the disappearance of the swellings. [*I. Leinwand: The Use of Local Anaesthesia in the Treatment of Sprains (or Local Tissue Injury without Open Wounds), The Military Surgeon, 92, (Jan. 1943): 60-63.*]

Thousands of soldiers are fighting for you against seasoned warriors under the handicap of rapid training. Are you in any way adding to that handicap or are you doing what you can to overcome it?

BOOK NOTICES

BAI Report on Calfhood Vaccination

This review of the results of calfhood vaccination is based on field activities of veterinarians of the federal Bureau of Animal Industry and coöperating states engaged in brucellosis eradication, and covers the period Jan. 1, 1936 to Jan. 1, 1942. The study deals with the degree of effectiveness of vaccination in preventing the disease and bringing about its control in affected herds. All the vaccine used in connection with this activity was prepared from strain 19. The work was performed in 260 herds containing 18,912 cattle, located in 24 states. Blood tests of the cattle in these herds disclosed 29.2 per cent of brucellosis infection, and an additional 8.4 per cent of the cattle gave suspicious reactions. Thus, there was ample evidence that the animals to be vaccinated would undergo exposure to the infection.

A total of 21,005 calves were vaccinated, and at the end of the study 17,737 of them remained in 241 herds that continued to operate under the plan. The remainder of the vaccinated animals had been disposed of for various reasons.

Normal Calvings 96.9 Per Cent of Total.—Over the entire period there were 17,608 calvings among the vaccinated animals, as they developed, involving six periods of pregnancy. Of the total number, 9,526 were first calvings; 4,993, second; 2,279, third; 688, fourth; 118, fifth, and 4 were sixth. Normal calvings numbered 17,056, or 96.9 per cent of the total. In the case of the normal calvings, 14,757 (86.6%) of the animals were negative to the test after calving; 677 (3.9%) were positive; and 1,622 (9.5%) were classed as suspicious. Therefore, 13.4 per cent of the cattle that calved normally were classified as either positive or suspicious soon after parturition. On the other hand, 552 of the vaccinated animals calved prematurely. This figure represented 3.1 per cent of the total calvings during the six years. Of these 552 cattle, 357 (64.7%) were negative to the test; 151 (27.4%) were positive; and 44 (7.9%) were classified as suspicious. Therefore, there were 195 abortions, or 1.1 per cent of the total calvings, that could be attributed to brucellosis, according to the test.

The above material was accumulated through nine semiannual reports received from inspectors in charge of this work in the field. From the last semiannual report covering the period from July 1, 1941, to Jan. 1, 1942, it is interesting to note that the percentage of the cattle calving normally that reacted to the test for brucellosis soon after parturition was 3.3 and the percentage of suspects, 5.7. Thus, a total of 9 per cent of the animals calving normally were either positive or suspicious, compared to

13.4 per cent in the total number of cattle calving normally during the entire time of the study. There were 76 abortions among the 3,328 calvings during this six-month period, but only 17 cows, or 0.5 per cent of the number calving, showed either a positive or suspicious reaction to the test after calving.

Brucellosis Reduced in Infected Herds.—At the close of the study, there were in the herds 718 of the original reactors and 189 of the original suspects. Of the positive nonvaccinated animals among those originally tested, 343 were found to be negative as a result of the test applied during the latter part of the six-year period, and 1,284 of the nonvaccinated negative cattle at the time of the original test were still negative on the last test. During the calendar year 1941, a total of 199 nonvaccinated cows which had been held in the herds since January, 1936 aborted. It is apparent from this extensive study of calfhood vaccination under field conditions that the incidence of brucellosis in these infected herds was greatly reduced. The owners of the herds in which this work was conducted were well pleased with the results, and many of them have written to this effect to the bureau inspectors in charge, under whose supervision the work was conducted. Much care was exercised by the veterinarians conducting this work in the field, which has had an important bearing on the favorable results obtained.

Recommendations for Obtaining Best Results.—The following points should be observed in order to obtain the best results in the use of Brucella vaccine in calfhood vaccination:

As the efficiency of the Brucella vaccine strain 19 is in inverse ratio to its age, the material should be ordered only when needed and in the desired quantity.

The vaccine should also be maintained at all times under proper refrigeration within a temperature range of 35 to 45 F.

The site of vaccination is preferably beneath the loose skin on the side of the neck, and the site should be treated in accordance with approved procedures before and after injection. Needles and syringes should be properly sterilized before being used.

It is believed that the most effective immunity will result in calves vaccinated between the ages of six and eight months, but it is customary, and more practical, to have the period cover from four to eight months.

Premises contaminated as a result of an abortion should be properly cleaned and disinfected. This practice is, of course, essential to prevent the spread not only of brucellosis but also other infectious diseases.

Probably 95 per cent of exposure in infected herds results from the placental tissue and discharges from aborting cattle or normally calving cows having uterine infection. It is such intense exposure that tends to break down the immunity in pregnant heifers or cows vaccinated as calves and makes the maintenance of maternity stalls, barns, and hospital pastures desirable.

An annual agglutination blood test of all cattle in the herd is a desirable practice to follow in order that the affected animals may be eventually eliminated.

The vaccinated calves should be adequately identified either by tattooing or tagging, or both.

As a result of the early part of this study, in addition to the available experimental data on the use of Brucella vaccine prepared from strain 19, it was decided in the latter part of 1940 to have calfhood vaccination made a part of the official plan of the control and elimination of brucellosis in cattle. Since Jan. 1941, a total of about 290,000 calves, located in 46 states and Puerto Rico, have been so vaccinated under coöperative state and federal supervision. [*A report by Chief John R. Mohler released on March 12, 1943 by the Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.*]

Fundamentals of Immunology

This book attempts to cultivate the happy thought that immunology is the practical science of disease prevention, not a highly theoretical subject. It covers the sum of knowledge thereof from the viewpoint of chemistry, not of pure biology, that is, the approach is chemical. Because the author is a chemist, exemption from disease—immunity—is a study of chemical formulas, although the power behind the chemical exchanges, which must somehow concern the process or conjugations which ward off disease, is as closed a chapter to the chemist as to the biologist. While no chemical formula for life is yet forthcoming, there is always hope for, at least, the coming of the synthetic antigen or antibody through chemistry, just as the doctors have not waited in vain for the bottled vitamins. There is real optimism in pronouncing immunity a simple matter and then taking the reader through a maelstrom of complex chemical formulas which few understand and which, up to the present time, have not been famous additions to the sum of practical knowledge. But, those who stop at the simpler facts of physiology, nevertheless applaud the chemist for his daring efforts, and that is the way *Fundamentals of Immunology* impresses this reviewer; for all of the great steps of medicine were taken the hard way—blasting through apparently impregnable obstacles. Chemistry attacking immunity is just that.

If this leaves the impression that the tone is not understandable, perish the thought. There isn't enough known chemistry of im-

munity to fill a book of that size. Chapters II to IV, on antibodies, antigens, and antigen cells, and chapters V and VI on blood groups and antibody reactions, respectively, make this book highly valuable for students of medicine, chemists, and biologists, and the practitioner will be fascinated by the way the author treats with anaphylaxis and allergy, the uses of artificial immunity. Technicians should certainly enjoy what the author has to say about his experiences in laboratory and clinical work. There are long lists of references at the end of each chapter which add to the value of this book by whomsoever used. [*Fundamentals of Immunology by William C. Boyd, Ph.D., Associate Professor of Biochemistry, Boston University. 446 pages. Cloth. Illustrated. Interscience Publishers, Inc., New York, N. Y. 1943. Price $5.50.*]

Food Poisoning

American veterinarians, many of whom practice food inspection on a large scale, have felt the need of books on food poisoning which circumscribe the ill-defined scope of the subject. Although the vague term—food poisoning—naturally embraces all injurious aliment eaten by man, the toxic animal product is its chief *raison d'etre* as a branch of knowledge. Except for explosive outbreaks among banqueters, food poisoning has attracted but little attention in the United States. The numerous isolated cases occurring in Continental Europe have not been prevalent in this country. One of the reasons given by the author is the excellent federal meat-inspection system, the salient points of which are described as effectual in keeping toxic meats out of the marts of trade. Quoting: "Under this system animals with Salmonella infections are detected and thus not sold for food." [To this it may be added that the slaughter of animals *d'urgence* to salvage sick and injured ones for human food, as is done systematically in Continental Europe, is not practiced in this country owing to our ambient abundance. A duty of the local veterinarian in Europe is to protect the interest of his clients in this respect and his country as to food conservation.]

Attempt is made to draw lines between *poison* and *infection* and between *putrefaction* and *poison*. Putrefaction is generally harmless and sometimes beneficial, examples of which are the odorous types of cheese. Food poisoning *per se* is confined chiefly to the explosive gastrointestinal upsets caused by the ingestion of toxins formed in food before it is eaten. As in the case of an injurious plant or chemical, the intoxicating agent is all there when the food is eaten, in contradiction to an intake of bacteria incubated within the digestive tract or beyond.

Poisonings from antimony, arsenic, cadmium, fluorides, lead, mercury, and zinc are described (11 pages). Thirteen pages are devoted to plant poisons (plankton, fava bean, white snake root, mushroom, ergot of rye, and water hemlock). The remainder of the book goes to the microbic food poisonings (Staphylococcus, Streptococcus, *Clostridium botulinum*, Salmonella spp., and miscellaneous bacteria). The prominence given to Staphylococcus is a revelation. This genus is pronounced the most common cause of food poisoning, contrary to a prevailing belief in veterinary medicine that the Salmonella species are the principal criminals in this connection, the reason being that most of the salmonelloses are infections, not food poisoning in the sense described. The rôle of poisoning by Salmonella organisms is regarded as "confused," because it was associated with food poisoning for many years before other types were recognized. The rule has been to blame Salmonella when *Cl. botulinum* could not be found. The confusion began when Gärtner (1888) discovered the microbe he named *Bacillus enteritidis* which is now classed among the Salmonella (*Salmonella enteritidis*). Food poisonings have been blamed on low titers of Salmonella where that genus played no part. This chapter of 18 pages of boiled down facts deserves careful study by veterinarians. Among special features are:

1) Long detailed questionnaires for patient and doctor to fill out in running down the cause of a case or outbreak of food poisoning, 2) a table for seven chemical poisonings, 3) a table of seven plant poisonings, 4) a list of the principal canned food most likely to cause food poisoning, 5) a table on the effect of botulinus antitoxin in experimental monkeys, 6) a table on growth and enterotoxin production by staphylococci introduced into food, 7) a table on the clinical characteristics of four of the main food poisonings (*Cl. botulinus*, Staphylococcus, Salmonella spp., and alpha Streptococcus), and 8) short sketches on bacillary and amebic dysentery, trichinosis, and unknowns.

References are numerous, index complete, University of Chicago style of usage is followed. Veterinarians are advised to procure a copy of this book. It is easy to read and full of material all of us ought to know. The hope is for a larger book covering the same ground and keeping within the bourne of the subject. With veterinarians inspecting food in many parts of the world just now, no book could be more handy and important than this small manual. [*Food Poisoning, by G. M. Dack, Ph.D., M.D., Assistant Professor of Bacteriology, The University of Chicago. Cloth. 138 pages. The University of Chicago Press, Chicago. 1943. Price $2.00.*]

Horse and Mule Population

Betwen census years, the United States Department of Agriculture compiles data on livestock population as of January 1, from approximately 140,000 crop and livestock reporters. The latest figures, for Jan. 1, 1943, republished by the Horse and Mule Association of America, Inc. are shown below. Wayne Dinsmore, in commenting on the data, says that the foals of 1942 should have totalled 645,000 for replacements alone, whereas there were but 401,000—less than two-thirds as many as needed. Mules needed for replacement were 206,000, whereas but 115,000 were foaled in 1942—but little over half of what it should be.

State and Div.	HORSES: Numbers on Farms, Jan. 1, 1943 (Preliminary)				MULES: Number on Farms, Jan. 1, 1943			
	Total	2 years and over	1-2 years	Under 1 year	Total	2 years and over	1-2 years	Under 1 year
	Thousands				Thousands			
Maine	36	35	1	—				
N. H.	14	14	—	—				
Vt.	41	39	1	1	Horse and mule population too low in these states to estimate			
Mass.	20	20	—	—				
R. I.	2	2	—	—				
Conn.	17	17	—	—				
N. Y.	278	264	7	7	4	4	—	—
N. J.	26	25	—	1	3	3	—	—
Pa.	239	228	6	5	40	39	1	—
N. Atl.	673	644	15	14	47	46	1	—
Ohio	377	354	14	9	21	21	—	—
Ind.	273	254	11	8	43	40	1	2
Ill.	453	424	18	11	62	53	4	5
Mich.	300	287	8	5	5	5	—	—
Wis.	470	443	17	10	4	4	—	—
E.N.C.	1,873	1,762	68	43	135	123	5	7
Minn.	579	540	24	15	9	9	—	—
Iowa	658	598	36	24	39	35	2	2
Mo.	519	466	28	25	192	159	17	16
N. Dak.	341	300	24	17	2	2	—	—
S. Dak.	344	290	30	24	5	4	—	1
Nebr.	458	419	27	21	43	35	4	4
Kans.	375	334	21	20	59	42	8	9
W.N.C.	3,274	2,938	150	146	349	286	31	32
N.Cent.	5,147	4,700	258	189	484	409	36	39
Del.	13	12	1	—	7	7	—	—
Md.	74	67	4	3	22	22	—	—
Va.	163	150	7	6	87	85	1	1
W. Va.	99	92	4	3	11	11	—	—
N. C.	80	75	3	2	298	296	1	1
S. C.	21	20	1	—	181	179	1	1
Ga.	38	35	1	2	304	302	1	1
Fla.	20	18	1	1	35	35	—	—
S.Atl.	508	469	22	17	945	937	4	4
Ky.	238	218	11	9	214	196	9	9
Tenn.	172	158	8	6	291	265	13	13
Ala.	66	60	3	3	294	288	3	3
Miss.	112	103	5	4	353	339	7	7
Ark.	198	165	11	11	253	233	10	10
La.	152	143	5	4	176	169	3	4
Okla.	351	314	19	18	130	105	13	12
Tex.	582	526	30	26	455	432	12	11
S. Cent.	1,861	1,688	92	81	2,166	2,027	70	69
Mont.	252	204	24	24	2	2	—	—
Idaho	168	148	10	10	4	4	—	—
Wyo.	128	106	11	11	2	2	—	—
Colo.	211	184	14	13	11	9	1	1
N. Mex.	120	106	7	7	11	9	1	1
Ariz.	73	62	6	5	6	6	—	—
Utah	83	69	7	7	1	1	—	—
Nev.	37	31	3	3	1	1	—	—
Wash.	123	111	6	6	5	5	—	—
Oreg.	127	114	7	6	5	5	—	—
Calif.	167	150	9	8	22	21	—	1
West.	1,499	1,285	104	100	70	65	2	3
U.S.	8,678	8,786	491	401	3,712	3,484	113	115

THE NEWS

AVMA

Program Outline for War Conference St. Louis, Mo., August 25-26, 1943

Below is the general plan of the abbreviated 1943 session as presently visualized. As announced in the April issue (p. 315), the meeting will be a two-day war conference plus transaction of the necessary business of the Association by the Board of Governors, Executive Board and House of Representatives.

This eightieth annual meeting will, in accordance with wartime conditions and official policies, provide only those features which are considered essential and relevant to the war effort. There will be no scientific, technical or commercial exhibits; section meetings will not be held but the general sessions will include important discussions which will have widespread interest and significance.

Association members in the St. Louis district are forming a skeleton committee on local arrangements which will be announced next month. This committee will look after the limited details required by this year's session. The chairman of the local committee is Dr. S. W. Haigler.

The Committee on Program (section officers and executive secretary) is proceeding slowly with the selection of program topics and speakers to present them. The uncertainties of the times prevent too early commitments but there will be a number of outstanding presentations by recognized authorities.

General Plan of Program—1943 Annual Meeting

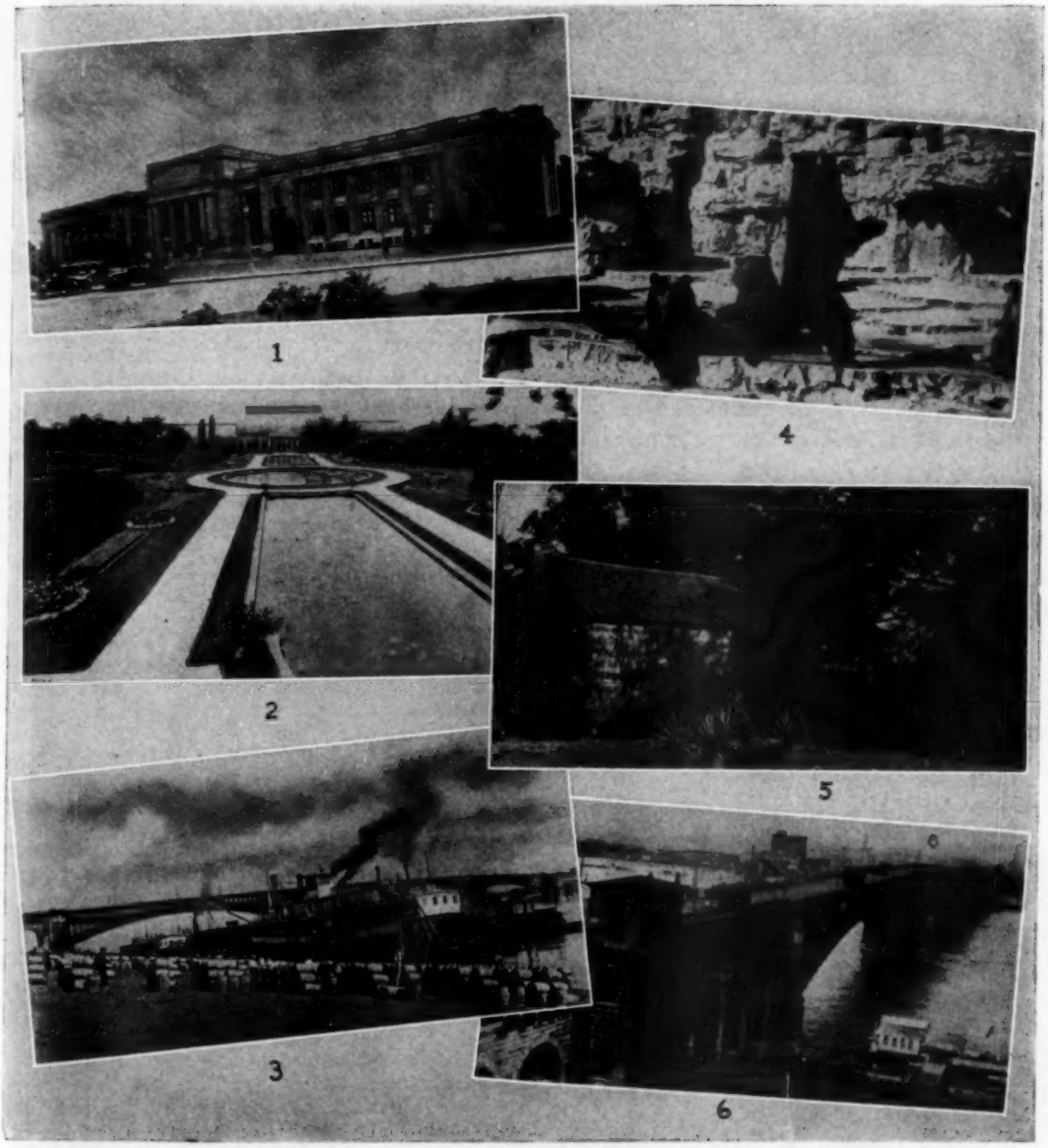
	Tuesday August 24	Wednesday August 25	Thursday August 26
A.M.	Executive Board; Committees; Registration.	Registration; House of Representatives.	General session; (Election polls open if necessary).
		Women's Auxiliary: Annual Meeting.	Alumni group meetings.
P.M.	Executive Board; Committees; Registration.	Opening session: President's address; Awards; Nomination of Officers; Addresses.	General session; (Final session of House if necessary); Adjournment.
NIGHT		Dinner and General Session	

Executive Board Nominations in Districts II and III

Nominating ballots were mailed on April 10 to members in Executive Board Districts II and III. The terms of the present members (Wm. H. Ivens, Sr., and J. L. Axby, respectively) from those districts expire at the close of the 1943 annual meeting, August 25-26.

District II includes Delaware, District of

St. Louis Scenes



1. Jefferson Memorial which houses the early historical records of Missouri. 2. Shaw's Garden (Missouri Botanical Garden), containing one of the finest collections of orchids. 3. Apple-shipping time on the St. Louis levee. 4. Part of the cageless bear pits in the St. Louis zoo. 5. The cabin in which Gen. Ulysses S. Grant lived prior to the Civil War. 6. Eads bridge. Built in 1874, it was the first bridge to span the Mississippi river.

Columbia, Maryland, New Jersey and Pennsylvania.

District III includes Illinois, Indiana and Wisconsin.

The nominating polls will close on June 10, 1943.

Can You Help Locate These Lost Members?

The aid of JOURNAL readers is solicited in locating the following members, mail to whom has been returned to the Association's central office. The last known address of each is given. Should you be able to provide information as to present residence, your advice *via* postcard or letter will be greatly appreciated.

Adams, James L., Rt. No. 2, Box 160, Greeley, Colo.

Barber, C. B., Harrison, Ohio.

Blumenthal, Jacob C., Brainerd, Minn.

Castro, Fred, General Delivery, Omaha, Neb.

Cohen, George, Pine Camp, N. Y.

Cox, M. T., 650 Irapelo Rd., Waltham, Mass.

Fluharty, D. M., Co. B—30 M.T.B., 1st Platoon, Camp Grant, Ill.

Gates, Silas B., 4018 S. 25th St., Omaha, Neb.

Hagler, Curtis E., 5224 50th S. Seattle Ave., Kirkland, Wash.

Heisel, Allen M., Cascade, Colo.

Holtzman, Jacob, Station Hosp., Army Air Base, Ft. Douglas, Utah.

Hupp, Lynn D., 1339 E. Armour, Kansas City, Mo.

Keller, G. E., 204 S. 1st St., Montevideo, Minn.

Loiler, M. E., Farragut, Iowa.

Lovvorn, R. D., 910 N. McLean St., Memphis, Tenn.

McFarlane, J. F., Main St., Payette, Idaho.

McGill, Dana T., Mt. Sterling, Ill.

McGinnis, Velmer W., Ft. Benning, Ga.

McKim, O. E., c/o Commanding Officer, Walter Reed Genl. Hosp., Washington, D. C.

Marks, Bernard, Vet. Hosp., Ft. Benning, Ga.

Mathis, Rudy C., State Veterinarian, Atlanta, Ga.

Melman, Harold, 4843 Reistertown Rd., Baltimore, Md.

Moffat, Geo. Colvin, 5732 W. Cermak Rd., Cicero, Ill.

Newhart, Charles C., Warren Hotel, Garden City, Kansas.

Niffenegger, D. L., Camp Gordon, Ga.

Robertson, D. S., Ft. Sam Houston, Texas.

Rushmore, Rowland W., Army Vet. School, Army Med. Center, Washington, D. C.

Sarde, Robert M., Army Veterinary School, Army Med. Center, Washington, D. C.

Schmille, H. F., Westobor, Mo.

Shay, Robert H., General Delivery, El Dorado, Ark.

Siver, Dougal, 429 Wrightwood Ave., Apt. 1-N, Chicago, Ill.

Smith, Chas. L., Rt. No. 1, Harveyville, Kansas.

Smith, Lawrence G., General Delivery, Waynesville, N. Car.

Tedder, P. W., Edenton, N. Car.

Thompson, J. C., Dept. of Agri., Olympia, Wash.

Vance, Arthur, Vernal, Utah.

Vogel, W. M., 457 Sandhurst Dr., Dayton, Ohio.

Williams, G. A., 1374 Sunset Blvd., Los Angeles, Calif.

What the Newspapers Say

(Excerpts from Educational Publicity Material issued by the AVMA Public Relations Department.)

Collinsville (Okla.) News

(Feb. 11, 1943)

American farmers can more than meet the government's increased pork production quota this year, officials of the American Veterinary Medical Association reported after a study of the swine production situation in the nation's principal hog-raising areas.

Frankfort (Ky.) State Journal

(Feb. 2, 1943)

A warning against one of the world's most ancient swine diseases, erysipelas, has been issued by the American Veterinary Medical Association through the Kentucky Agricultural Experiment Station.

Philip (S. Dak.) Pioneer Review

(Mar. 11, 1943)

Control of animal disease is a vital war job for the farmer, Dr. Frank Licklyter, state college extension veterinarian, said today in calling attention to a statement of the American Veterinary Medical Association.

Eureka (Kan.) Farm Bureau News

(Mar. 16, 1943)

Swine erysipelas is now spreading so extensively in American farming areas that it may soon outrank hog cholera as a killer of farm animals according to information published in the official Journal of the American Veterinary Medical Association.

Kansas City (Mo.) Drovers Telegram

(Mar. 10, 1943)

Slaughter and disease are decimating European herds and flocks, says Dr. O. V. Brumley, of the American Veterinary Medical Association, from which he draws the conclusion that the livestock industry of this country will eventually be called upon to supply animals for restocking purposes.

Chicago (Ill.) Herald-American
(Mar. 19, 1943)

Persons patronizing the "black market" in meat are not only violating the law, but are taking long chances with their health, Dr. J. G. Hardenbergh, executive secretary of the American Veterinary Medical Association, 600 S. Michigan Ave., warned the public today.

Chicago (Ill.) Herald-American
(Mar. 17, 1943)

A warning was issued here today by the American Veterinary Medical Association that farmers cannot achieve this year's increased pork quotas solely by raising more litters of Spring pigs. The two measures by which the pork output can be raised, the report states, are prevention of baby pig losses and reducing the toll from disease.

Newspaper Headlines

Horse Typed for Similarity to Sleeping Sickness in Man.—*Topeka (Kan.) Daily Capital.*

Veterinarians' Value to Cattle Industry Cited.—*Baton Rouge (La.) Advocate.*

Cattle Losses from Blackleg in State Grow.—*Clayton (Mo.) Advocate.*

State Expansion Local Veterinary Group Suggested.—*Fallon (Nev.) Eagle.*

Hog Raisers Warned Against Erysipelas.—*Floresville (Tex.) Journal.*

Veterinarians Join in Drive for War Dogs.—*Champaign (Ill.) News.*

Control of Animal Disease Vital Now.—*Midland (S. Dak.) Mail.*

Other Newspaper Comment

Veterinarians Seek to Boost Output of Wool

Under this heading, an AP dispatch dated April 12, from Laramie, Wyo., said that "American livestock and veterinary groups have created a committee of specialists to study ways and means of increasing sheep and wool production to meet war needs. Subjects for study include the prevention of losses by death; improved feeding and management practices, and improvement of range conditions."

Members of the committee are F. S. Hultz, professor of animal husbandry, University of Wyoming; I. B. Boughton, D.V.M., in charge of sheep and goat disease investigations at the Sonora (Texas) Agricultural Experiment Substation; R. F. Miller, professor of animal husbandry, University of California, Davis; J. C. Cunningham, State College, New Mexico, and D. S. Bell, associate in sheep and wool investigations, Ohio Experiment Station, Wooster.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

BARTON, ROBERT A.
1001 Kenmore Ave., Fredericksburg, Va.
V.M.D., University of Pennsylvania, 1941.
Vouchers: L. L. Lieberman and T. P. Rowe.

BRAUNWORTH, ELMER H.
Chaska, Minn.
D.V.M., Iowa State College, 1940.
Vouchers: J. McKay, Jr. and H. M. Larson.

COLGATE, R. F.
17 Rectory Rd., Weston, Ont., Can.
B.V.Sc., Ontario Veterinary College, 1941.
Vouchers: Edith Williams and W. Moynihan.

DEVOLT, H. M.
5009 Hollywood Rd., Berwyn, Md.
D.V.M., Cornell University, 1923.
Vouchers: Mark Welsh and A. L. Brueckner.

HAVEL, DR. S. N.
301 S. 4th St., Denver, Pa.
D.V.M., Alabama Polytechnic Institute, 1937.
Vouchers: C. P. Bishop and P. V. Clarkson.

JOHNSTON, JAMES M.
450 E. Holly Ave., Pitman, N. J.
V.M.D., University of Pennsylvania, 1934.
Vouchers: G. A. Dick and R. L. Ticehurst.

MILLER, M. W.
2204 San Jacinto St., Houston, Texas.
D.V.M., Terre Haute Veterinary College, 1913.
Vouchers: H. K. Edmondson and J. Ramsey.

PARKER, C. M.
Box 741, Warrenton, Va.
D.V.M., Ohio State University, 1935.
Vouchers: C. R. Pastors and R. T. Gregory.

SEGAL, LAWRENCE
210½ Abbott Rd., Apt. 32, East Lansing, Mich.
D.V.M., Michigan State College, 1940.
Vouchers: J. P. Hutton and J. W. Cunkelman.

Second Listing

Boden, Anthony A., 14437 Michigan Ave., Dearborn, Mich.

Buzby, Gordon P., Huntingdon Pike & Shady Lane, Fox Chase, Pa.

Constance, L., Parkfield Gravelly Hill, Birmingham, Eng.

Eash, Alden T., 14437 Michigan Ave., Dearborn, Mich.

Hare, Hobart, 16 W. Main St., Newark, Dela.

Leslie, J. H., Canada Packers Ltd., Peterborough, Ont., Can.

McClellan, D. J., Insp-in-Charge, Canada Packers Ltd., Peterborough, Ont., Can.

Manley, Philip C., Malta, Ohio.

Parkhill, Wm. Lee, 613 Dominion Public Bldg., Winnipeg, Man., Can.
Richter, Carl M., 10 Chestnut St., Newville, Pa.
Robertson, James F., 390 Prospect St., Berea, Ohio.
Somers, Robert K., 205 Post Office Bldg., South St. Paul, Minn.
Stein, J. S., 1508 N. 54th St., E. St. Louis, Ill.
Taylor, V. G., Leipsic, Ohio.
Walker, R. V. L., 21 Hampton Ave., Ottawa, Ont., Can.
Whitcomb, F. L., P. O. Box 611, Bismarck, N. Dak.

1943 Graduate Applicants

First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Iowa State College

ANDERSON, G. ORVILLE, D.V.M.
Swea City, Iowa.
Vouchers: F. E. Walsh and H. D. Bergman.

BANKS, ROBERT C., D.V.M.
Tipton, Iowa.
Vouchers: H. F. Beardmore and H. D. Bergman.

BECKER, LEO F., D.V.M.
401 S. Clark, Maquoheta, Iowa.
Vouchers: H. D. Bergman and G. R. Fowler.

BRAGER, R. C., D.V.M.
Clear Lake, Iowa.
Vouchers: H. D. Bergman and E. A. Hewitt.

BROWN, RUSSELL W., D.V.M.
Gran Apts., Storm Lake, Iowa.
Vouchers: R. A. Packer and I. A. Merchant.

CALHOUN, WILLIAM H., D.V.M.
Huxley, Iowa.
Vouchers: D. A. Smith and W. H. Chivers.

DYKSTRA, C. F., D.V.M.
George, Iowa.
Vouchers: F. E. Walsh and H. D. Bergman.

FISHER, LESTER, D.V.M.
2880 Archer Ave., Chicago, Ill.
Vouchers: F. E. Walsh and G. R. Fowler.

FISTLER, RAY P., D.V.M.
Freeport, Ill.
Vouchers: C. H. Covault and E. A. Hewitt.

FLICKINGER, MILTON, D.V.M.
R.F.D. No. 1, Aurora, Iowa.
Vouchers: H. D. Bergman and F. E. Walsh.

GRAY, D. H., D.V.M.
Schaller, Iowa.
Vouchers: G. R. Fowler and C. H. Covault.

GRIFFITHS, HENRY J., D.V.M.
9 Elmwood Apts., South St.,
Halifax, Nova Scotia, Can.
Vouchers: E. A. Benbrook and H. D. Bergman.

HAIGHT, P. M., D.V.M.
118 Denver St., Sterling, Colo.
Vouchers:

HYLTON, JACK WARREN, D.V.M.
404 W. 69th St., Los Angeles, Calif.
Vouchers: G. R. Fowler and E. A. Hewitt.

IRVINE, ROBERT D., D.V.M.
127 Campus Ave., Ames, Iowa.
Vouchers: H. D. Bergman and D. A. Smith.

KARPER, MELVIN W., D.V.M.
Slater, Iowa.
Vouchers: H. D. Bergman and Chas. Murray.

KLETT, WILBERT M., D.V.M.
Milford, Iowa.
Vouchers: Chas. Murray and E. A. Benbrook.

LOFTEN, ROBERT DOUGLAS, D.V.M.
Lakota, N. Dak.
Vouchers: H. L. Foust and R. A. Runnells.

LOUCKS, JOSEPH L., D.V.M.
c/o Dr. C. L. Wilhite, Manning, Iowa.
Vouchers: F. E. Walsh and W. H. Chivers.

MCINTIRE, J. C., D.V.M.
606 Franklin St., Pella, Iowa.
Vouchers: H. D. Bergman and C. H. Covault.

MACKERETH, ROBERT D., D.V.M.
Annandale, Minn.
Vouchers: H. D. Bergman and R. A. Runnells.

MANNASMITH, CLARENCE H., D.V.M.
Clarinda, Iowa.
Vouchers: D. A. Smith and C. H. Covault.

MARSH, HERBERT L., D.V.M.
Woodstock, Ill.
Vouchers: H. D. Bergman and G. R. Fowler.

MELLES, LEONARD H., D.V.M.
Paullina, Iowa.
Vouchers: H. D. Bergman and C. H. Covault.

MORGAN, RICHARD, D.V.M.
818 Eighth St., Ames, Iowa.
Vouchers: G. H. Conner and F. E. Walsh.

NELSON, ALBIN J., D.V.M.
Gravity, Iowa.
Vouchers: L. E. St. Clair and H. F. Beardmore.

O'HARRA, JOHN L., D.V.M.
Merced Vet. Hosp., Merced, Calif.
Vouchers: D. A. Smith and C. H. Covault.

PENKERT, R. A.
Reedsburg, Wis.
Vouchers: F. E. Walsh and W. H. Chivers

PENNINGS, A. W., D.V.M.
Alton, Iowa.
Vouchers: H. D. Bergman and D. A. Smith.

RAWSON, D. WAYNE, D.V.M.
Elburn, Ill.
Vouchers: G. R. Fowler and D. A. Smith.

REPPERT, R. F., D.V.M.
Pender, Neb.
Vouchers: D. A. Smith and E. V. Beamer.

REPPERT, R. E., D.V.M.
108 E. Division, Kewanee, Ill.
Vouchers: E. V. Beamer and H. F. Beardmore.

RHODES, JAMES D., D.V.M.
1404 Park Ave., Fort Dodge, Iowa.
Vouchers: G. R. Fowler and D. A. Smith.

ROSSING, TEDMAR D., D.V.M.
Bode, Iowa.
Vouchers: D. A. Smith and G. R. Fowler.

SAVAGE, ROBERT E., D.V.M.
701 E. Park Ave., Spencer, Iowa.
Vouchers: R. A. Runnells and Chas. Murray.

SCHWEIM, ERICH A., D.V.M.
Springfield, Minn.
Vouchers: I. A. Merchant and C. H. Covault.

SKAMSER, LEONARD M., D.V.M.
Litchfield, Minn.
Vouchers: D. A. Smith and E. V. Beamer.

SMITH, PHILIP E., D.V.M.
Clarion, Iowa.
Vouchers: C. H. Covault and D. A. Smith.

SPAULDING, DONALD L., D.V.M.
3304 Maple St., Omaha, Neb.
Vouchers: H. D. Bergman and I. A. Merchant.

STEPP, F. A., D.V.M.
400 W. Main, Union City, Tenn.
Vouchers: H. D. Bergman and G. R. Fowler.

SWAIN, LYLE W., D.V.M.
Osceola, Iowa.
Vouchers: R. A. Runnells and D. A. Smith.

THOMPSON, FLOYD W., D.V.M.
912-23rd St., Sioux City, Iowa.
Vouchers: N. L. Nelson and H. D. Bergman.

VANDE GARDE, GERALD C., D.V.M.
Brooklyn, Iowa.
Vouchers: H. D. Bergman and D. A. Smith.

WAHL, ROBERT CHARLES, D.V.M.
Gladbrook, Iowa.
Vouchers: G. R. Fowler and D. A. Smith.

WINSLADE, JACK LAMAR, D.V.M.
Shipman, Ill.
Vouchers: E. A. Benbrook and I. A. Merchant.

Michigan State College*

APPELHOF, WILLIAM K., D.V.M.
Rt. No. 2, Grand Blanc, Mich.
Vouchers: J. P. Hutton and E. K. Sales.

AUKER, JOE A., D.V.M.
R.R. No. 2, South Whitley, Ind.
Vouchers: J. P. Hutton and J. W. Cunkelman.

BEEBE, GERALD J., D.V.M.
403½ S. Main, Royal Oak, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

BEEBE, RAYMOND, D.V.M.
518 N. Stewart, Fremont, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

BENSON, HERBERT JAY, D.V.M.
237½ Valley Ct., East Lansing, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

BESANCON, FREDERICK W., D.V.M.
15006 Biltmore Ave., Detroit, Mich.
Vouchers: J. P. Hutton and B. J. Killham.

BLUME, ERVIN VIRGIL, D.V.M.
R.R. No. 9, Fort Wayne, Ind.
Vouchers: C. F. Clark and B. J. Killham.

CARLSON, PAUL A., D.V.M.
2329 Edwards St., Berkeley, Calif.
Vouchers: C. F. Clark and B. J. Killham.

CHAPEL, DONALD FLOYDE, D.V.M.
903 Lansing Ave., Jackson, Mich.
Vouchers: J. P. Hutton and I. F. Huddleson.

CONNAUGHTON, HAROLD, D.V.M.
Lawrance, Mich.
Vouchers: E. K. Sales and J. P. Hutton.

CORRIE, GARTH, D.V.M.
R.F.D. No. 2, Lake, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

CREESWELL, RICHARD A., D.V.M.
213 Prospect, St. Louis, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

CULHAM, MERRILL EUGENE, D.V.M.
219 N. Page St., Stoughton, Wis.
Vouchers: J. P. Hutton and J. W. Cunkelman.

DECKER, NORMAN K., D.V.M.
Colon, Mich.
Vouchers: J. W. Cunkelman and B. J. Killham.

DOLL, ELVIS R., D.V.M.
Dept. of Ani. Path., University of Kentucky, Lexington, Ky.
Vouchers: C. F. Clark and B. J. Killham.

ELLIS, DAVID J., D.V.M.
R.F.D. No. 2, Corunna, Mich.
Vouchers: C. A. Brandly and C. O. Prickett.

FELDMAN, HENRY FRED, JR., D.V.M.
Deerfield, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

FERGUSON, FREDERICK, D.V.M.
2020 Madison Ave., Grand Rapids, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

FOSTER, HOWARD K., D.V.M.
170 N. 2nd West St., Cedar City, Utah.
Vouchers: J. P. Hutton and J. W. Cunkelman.

HOLTZ, FRED, D.V.M.
Rochester, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

HORNBACKER, VERN G., D.V.M.
Sebewaing, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

JEFFERY, GEORGE, D.V.M.
Sherwood, Mich.
Vouchers: J. P. Hutton and B. J. Killham.

KASER, CLARENCE LEMOYNE, D.V.M.
Rt. No. 6, St. Johns, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

KING, HAROLD C., D.V.M.
205 Moores River Dr., Lansing, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

KINNE, HARRY W., D.V.M.
337 Post Office Bldg., Bismarck, N. Dak.
Vouchers: J. P. Hutton and J. W. Cunkelman.

KOSHT, DUANE L., D.V.M.
910 Seward, Detroit, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

LUOTO, LAURI, D.V.M.
7 Coleman St., Gardner, Mass.
Vouchers: J. P. Hutton and J. W. Cunkelman.

MCAFEE, JOHN, D.V.M.
R.R. No. 1, Applegate, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

MCLEOD, KENNETH LEROY, D.V.M.
403 Oxford Rd., East Lansing, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

MOORE, DONALD L., D.V.M.
Athens, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

MORRIS, JOHN H., II, D.V.M.
935 E. Grand River, East Lansing, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

MORSE, WENDELL C., D.V.M.
710 Shepard St., Lansing, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

MUNRO, HARRY R., D.V.M.
516 E. Lincoln Ave., Zeeland, Mich.
Vouchers: J. P. Hutton and E. K. Sales.

MYHERS, PALMER S., D.V.M.
Eleva, Wis.
Vouchers: C. F. Clark and B. J. Killham.

NEUHAUSER, MAURICE D., D.V.M.
c/o W. G. Theobald, Archbold, Ohio.
Vouchers: C. F. Clark and B. J. Killham.

OSBORN, LEE H., D.V.M.
1002 W. Main St., Danville, Ind.
Vouchers: J. P. Hutton and T. O. Roby.

QUINN, JOHN F., D.V.M.
Elkton, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

RITCHIE, JAMES R., D.V.M.
R.F.D. No. 1, Plymuth, Mich.
Vouchers: E. K. Sales and J. P. Hutton.

SEGAL, DOROTHY, D.V.M.
210½ Abbott Rd., Apt. 32, East Lansing, Mich.
Vouchers: J. P. Hutton and J. W. Cunkelman.

SHEETS, WAYNARD R., D.V.M.
1461 E. Ohio St., Frankfort, Ind.
Vouchers: J. P. Hutton and J. W. Cunkelman.

SHILLINGER, ROBERT B., D.V.M.
Easton, Talbot County, Md.
Vouchers: J. P. Hutton and B. J. Killham.

STOE, LYSLE ARNOLD, D.V.M.
Church's Ferry, N. Dak.
Vouchers: J. B. Hutton and J. W. Cunkelman.

TEN BROECK, CHARLES WALTER, D.V.M.
22739 Grove Ave., East Detroit, Mich.
Vouchers: C. F. Clark and B. J. Killham.

VANDER WALL, EDWIN R., D.V.M.
New Era, Mich.
Vouchers: L. B. Sholl and J. P. Hutton.

WHEELER, JAMES E., D.V.M.
72 East State St., Montpelier, Vt.
Vouchers: J. B. Hutton and J. W. Cunkelman.

WILSON, J. A., D.V.M.
586 Dyer St., Burlington, Wis.
Vouchers: E. S. Feenstra and Frank Thorp, Jr.

WOOD, IVAN H., D.V.M.
423 Charles, East Lansing, Mich.
Vouchers: J. P. Hutton and E. K. Sales.

WOODWARD, JOHN B., D.V.M.
1718 Yohara Pl., Madison, Wis.
Vouchers: J. B. Hutton and J. W. Cunkelman.

WRIGHT, BETTY, D.V.M.
Fowlerville, Mich.
Vouchers: J. B. Hutton and J. W. Cunkelman.

Ohio State University

All of the following applicants were vouched for by Drs. P. A. Soldner and W. F. Guard.

ABBOTT, WILLIAM L., D.V.M.
Rt. No. 1, Broadlawn Farm, Downers Grove, Ill.

BAILEY, ROBERT M., D.V.M.
518 13th St., Bowling Green, Ky.

BLAIR, ALBERT R., D.V.M.
2000 Tate Ave., Cleveland, Ohio.

BREMER, LOUIS H., D.V.M.
Wilmington, Ohio.

BURTON, ARTHUR A., D.V.M.
Westerville, Ohio.

CHEHAYL, CLARENCE, D.V.M.
3424 W. 90th St., Cleveland, Ohio.

CLARK, ROBERT P., D.V.M.
Rt. No. 2, Bellefontaine, Ohio.

CLAUGUS, FREDERICK, D.V.M.
Woodsfield, Ohio.

COLE, CLARENCE R., D.V.M.
Ohio State University, Veterinary Clinic, Columbus, Ohio.

DUBER, ANTHONY G., D.V.M.
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Rt. No. 1, Carthage, Ill.

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JUNK, DICK R., D.V.M.
Rt. No. 6, Washington C. H., Ohio.

KRANTZ, ELDEN, D.V.M.
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LAMB, HUGH, D.V.M.
Rt. No. 2, Ashville, Ohio.

MCCLARREN, R. M., D.V.M.
1456 Loretta Ave., Columbus, Ohio.

MCQUOWN, PAUL F., D.V.M.
724 N. Campbell, Tucson, Ariz.

MAINWARING, GLYN, D.V.M.
1864 E. 97th St., Cleveland, Ohio.

MEISINGER, FRED H., D.V.M.
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MILLER, ROBERT R., D.V.M.
11 Hamilton Ave., Wheeling, W. Va.

MILTON, CHARLES S., D.V.M.
Charles Town, W. Va.

MONTGOMERY, CHARLES W., D.V.M.
622 N. Galloway St., Xenia, Ohio.

NEWTON, WILLIAM H., D.V.M.
Ashville, Ohio.

NICKERSON, JOHN H., D.V.M.
Orwell, Vt.

OLDHAM, WILLIAM R., D.V.M.
Rt. No. 2, Carthage, Ind.

PATTON, CLYDE A., D.V.M.
303 E. Cecil St., Springfield, Ohio.

PECK, EDSELL C., D.V.M.
Rt. No. 1, West Middletown, Ohio.

PRIESTLEY, ARCHIE C., D.V.M.
Gallipolis, Ohio.

RIPLEY, RICHARD A., D.V.M.
Rt. No. 2, Kent, Ohio.

ROSS, WALTER E., D.V.M.
471 Stowe Ave., Cuyahoga Falls, Ohio.

RUMPLER, WARD V., D.V.M.
Rt. No. 1, Grafton, Ohio.

SCHOONOVER, HOBART D., D.V.M.
214 E. Sandusky St., Findley, Ohio.

SOUTHARD, FRANCIS I., D.V.M.
105 Don Allen Rd., St. Mathews, Ky.

SPANABEL, JOHN J., D.V.M.
87 Vine St., East Palestine, Ohio.

SPROWL, R. W., D.V.M.
2243 Neil Ave., Columbus, Ohio.

STOUT, ROBERT W., D.V.M.
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1466 Michigan Ave., Columbus, Ohio.

TRAPHAGEN, DOUGLAS, D.V.M.
290 E. Lane Ave., Columbus, Ohio.

VOLLMER, JOHN H., D.V.M.
2615 Maplewood Ave., Toledo, Ohio.

VOSS, ROBERT F., D.V.M.
St. Johns, Ohio.

WALTERS, RALPH D., D.V.M.
91 W. 10th Ave., Columbus, Ohio.

WEIGHT, THOMAS H., D.V.M.
445 Mt. Vernon Rd., Newark, Ohio.

WELBOURN, RUSSELL W., D.V.M.
Union City, Ind.

WINKLER, J. E., D.V.M.
240 Rosemont Ave., Fort Thomas, Ky.

WYNKOOP, JUDSON R., D.V.M.
1495 Pennsylvania Ave., Columbus, Ohio.

Ontario Veterinary College

ZLOTNICK, LEON, B.V.Sc.
322 Church Ave., Winnipeg, Man., Can.
Vouchers: R. A. McIntosh and C. D. McGilvray.

University of Pennsylvania

ABRAHAMSON, JOSEPH, V.M.D.
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BERKELHAMMER, ALBERT M., V.M.D.
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BROWN, JOSEPH F., V.M.D.
P. O. Box 465, Dunsmuir, Calif.
Vouchers: G. H. Hart and G. A. Dick.

COLLINS, DANIEL J., V.M.D.
1000 South St., Pittsfield, Mass.
Vouchers: R. L. Collins and D. G. Lee.

DEMOTT, THOMAS, V.M.D.
Millington, N. J.
Vouchers: J. D. Beck and W. B. Boucher.

DETWEILER, J. WARREN, V.M.D.
Telford, Pa.
Vouchers: M. A. Emmerson and F. E. Lentz.

DOOLITTLE, HERBERT S., JR., V.M.D.
Litchfield Turnpike, c/o Westville P. O., New Haven, Conn.
Vouchers: J. J. Flaherty and D. G. Lee.

DOWNHILL, WALLACE J., V.M.D.
65 Eddy St., Springfield, Mass.
Vouchers: E. T. Booth and D. G. Lee.

ELTING, STEWART E., V.M.D.
P. O. Box 173, Woodbury, Conn.
Vouchers: R. F. Davenport and F. E. Lentz.

FRIDIRICI, IRA M., V.M.D.
Orwigsburg, Pa.
Vouchers: E. T. Booth and W. J. Lentz.

GARTNER, HAROLD H., V.M.D.
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Vouchers: W. B. Boucher and D. G. Lee.

GOOD, ARCHIE L., V.M.D.
223 N. George St., Millersville, Pa.
Vouchers: M. A. Emmerson and J. H. Mark.

GROVEMAN, JOSEPH H., V.M.D.
210 Farnsworth Ave., Bordentown, N. J.
Vouchers: J. D. Beck and D. G. Lee.

GUSS, SAMUEL B., V.M.D.
931 Oley St., Reading, Pa.
Vouchers: W. J. Lentz and H. M. Martin.

HALL, JONATHAN P., V.M.D.
54 Seventh St., Lowell, Mass.
Vouchers: W. B. Boucher and F. E. Lentz.

HICKMAN, GEORGE R., JR., V.M.D.
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HIGH, WILLIAM P., V.M.D.
105 Pine St., Middletown, Pa.
Vouchers: F. E. Lentz and J. T. Zurbrugg.

HITCHNER, S. B., V.M.D.
Daretown, N. J.
Vouchers: F. R. Beaudette and J. D. Beck.

IOBST, F. MURRAY, V.M.D.
120 Macungie Ave., Emmaus, Pa.
Vouchers: F. E. Lentz and E. J. Van Tilborg.

KEELER, JOHN R., V.M.D.
3804 Albermarle St., N. W., Washington, D. C.
Vouchers: F. E. Lentz and J. D. Beck.

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54 Mack St., Plains, Pa.
Vouchers: M. A. Emmerson and D. G. Lee.

LARSON, HOWARD S., V.M.D.
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Vouchers: M. A. Emmerson and W. B. Boucher.

LIPPINCOTT, JOHN E., V.M.D.
22 Euclid Ave., Haddonfield, N. J.
Vouchers: F. H. Schneider and F. E. Lentz.

LISCOMB, JOHN, V.M.D.
Hulls Cove, Maine.
Vouchers: L. S. Cleaves and F. E. Lentz.

MATTERN, GEORGE WILSON, V.M.D.
709 N. Duke St., Lancaster, Pa.
Vouchers: F. E. Lentz and J. D. Beck.

NORRIS, H. WARD, V.M.D.
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O'KEEFE, FRANCIS A., V.M.D.
Pine Brook Farm, Box 398, Warrenton, Va.
Vouchers: M. A. Emmerson and D. G. Lee.

OSEN, EDWIN J., V.M.D.
Anita, Iowa.
Vouchers: M. A. Emmerson and F. D. Weimer.

POWER, FRANCIS E., V.M.D.
Birdsboro, Pa.
Vouchers: C. A. Roll and F. E. Lentz.

ROSS, MORRIS H., V.M.D.
4240 Viola St., Philadelphia, Pa.
Vouchers: M. A. Emmerson and D. G. Lee.

RYAN, EDWARD T., JR., V.M.D.
143 Winchester St., Brookline, Mass.
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SHELLENBERGER, JAMES M., V.M.D.
Tannersville, Pa.
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339 Gates St., Roxobrough, Philadelphia, Pa.
Vouchers: W. B. Boucher and E. J. Van Tilborg.

SPERLING, F. GEORGE, V.M.D.
Anthony and New Ardmore Aves., Brookthorp Hills, Newtown Square, Pa.
Vouchers: W. B. Boucher and D. G. Lee.

STEFANICK, JACK E., V.M.D.
R.F.D. No. 2, Sharpsville, Pa.
Vouchers: J. D. Beck and E. J. Van Tilborg.

STRITTMATTER, THOS. P., JR., V.M.D.
R.D. No. 5, West Chester, Pa.
Vouchers: J. D. Beck and F. E. Lentz.

SWARTZ, ABRAHAM L., V.M.D.
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Vouchers: H. M. Martin and M. A. Emmerson.

SWOPE, ROBERT E., V.M.D.
701 Lees Ave., Collingswood, N. J.
Vouchers: M. A. Emmerson and D. G. Lee.

WAPLE, M. J., JR., V.M.D.
Rt. No. 3, Box 59, Alexandria, Va.
Vouchers: G. A. Dick and C. A. Roll.

WEBER, ROBERT B., V.M.D.
R.D. No. 2, Mechanicsburg, Pa.
Vouchers: F. E. Lentz and M. A. Emmer

WHITLOCK, JAMES A., V.M.D.
3812 Locust St., Philadelphia, Pa.
Vouchers: J. D. Beck and M. A. Emmer

Second Listing

Alabama Polytechnic Institute

Adams, Charles E. R., D.V.M., Kensington, M
Anderson, John, D.V.M., P. O. Box 191, Delr Beach, Fla.
Beaty, R. W., Jr., D.V.M., 606 N. Purdy S Sumter, S. Car.
Blalock, Avery Lamar, D.V.M., Nicholls, Ga.
Bowen, Samuel Reid, Jr., D.V.M., Tifton, Ga.
Boyd, Carl Ellis, D.V.M., 202 Capital Ave Raleigh, N. Car.
Case, Francis H., D.V.M., Wagner Heights, S vannah, Ga.
Clanton, J. Roland, D.V.M., Veterinary Hos Thomasville, Ga.
Cochran, W. B., D.V.M., Box 222, Pauls Valle Okla.
Coffee, George D., D.V.M., Boyds, Md.
Connor, Nolen D., D.V.M., 111 Thomas St., A burn, Ala.
Coppage, Dudley Ross, D.V.M., Vanceboro, N Car.
Crans, Joe Bower, D.V.M., Dixie, Ga.
Dawsey, Benjamin W., D.V.M., Aynor, S. Ca
Dean, Gilbert F., D.V.M., Somerville, Ala.
Douglas, A. B., D.V.M., 2519—36 Ave., N. Bir ingham, Ala.
Ennis, Luther M., D.V.M., Salem, Ala.
Fancher, James M., D.V.M., Wilton, Ala.
Fichandler, Philip D., D.V.M., 76 York St., N Haven, Conn.
Flynn, Billie U., D.V.M., Rt. No. 2, Box 16 Birmingham, Ala.
Forester, Samuel G., D.V.M., Manning, S. Ca
Glazener, Walter Warren, D.V.M., Brevard, N Car.
Hall, Hoyt, D.V.M., Pinellas Park, Fla.
Harrell, Wilson H., D.V.M., Enterprise, Ala.
Hayes, Thomas A., D.V.M., Thorsby, Ala.
Hicks, Warren H., D.V.M., 1276 P. O. Box, 16 Western Ave., Rocky Mount, N. Car.
Irby, L. E., D.V.M., Eufaula, Ala.
Irvin, Hugh, D.V.M., 430 W. Cambridge Av College Park, Ga.
Isbel, W. J., Jr., D.V.M., 116 E. Battle S Talladega, Ala.
Jordan, Edward M., D.V.M., Allen, Ala.
Kaminis, Clinton N., D.V.M., 553 Division S Tarpon Springs, Fla.
Lee, Robert E., D.V.M., Box 25, Marianna, Fl
Lindsey, Walter L., D.V.M., 204 Webster S Galax, Va.
London, Jack, D.V.M., Goodwater, Ala.

adows, Marion E., Jr., D.V.M., R.F.D. No. 1, Phenix City, Ala.
oore, W. L., D.V.M., Roba, Ala.
organ, Harry H., D.V.M., Cunningham, Tenn.
owlin, Chas. L., D.V.M., 3719 Mobile Highway, Pensacola, Fla.
itevint, C. H., D.V.M., Dothan, Ala.
pe, Eugene J., D.V.M., Newsome, Va.
tney, W. W., D.V.M., Farmville, Va.
ilty, Mark A., Jr., D.V.M., 823 Common St., Lake Charles, La.
ddle, John T., D.V.M., R.F.D. No. 2, Piedmont, S. Car.
ence, William E., D.V.M., Rt. No. 4, Dover, Dela.
afford, Alfred L., D.V.M., 1st National Bank Bldg., Monticello, Ga.
earns, Joseph T., D.V.M., 4009 St. Ives Ct., Louisville, Ky.
hrasher, John P., Jr., D.V.M., Gen. Del., Baton Rouge, La.
Turner, Albert U., D.V.M., 809—22nd St., Columbus, Ga.
Weissinger, W. W., D.V.M., Eutaw, Ala.
Whitney, George D., D.V.M., Oakwood Rd., Orange, Conn.
Williams, J. M., D.V.M., Moncks Corner, S. Car.
Young, Leonard E., D.V.M., 1304 Pickens St., Columbia, S. Car.
Young, Lester B., D.V.M., Rt. No. 2, Johnson City, Tenn.

Texas A. & M. College

Lacey, Lee Thomas, D.V.M., Rt. No. 2, Box 121½, Oakdale, Calif.

COMMENCEMENTS

Alabama Polytechnic Institute

At the commencement exercises of Alabama Polytechnic Institute, on Feb. 26, 1943, the following candidates were presented for the

—From the Foundation of Animal Health

degree of Doctor of Veterinary Medicine by R. S. Sugg, dean of the School of Veterinary Medicine:

Adams, Charles E. R.
Anderson, John E.
Beaty, Robert W.
Blalock, Avery L.
Bowen, Samuel R., Jr.
Boyd, Carl E.
Case, Francis H.
Clanton, James R.
Cochran, Wilbur B.
Coffee, George D.
Connor, Nolen D.
Coppage, Dudley R.
Crane, Joe B.
Dawsey, Benjamin W.
Dean, Gilbert F.
Douglas, Arthur B.
Ennis, Luther M.
Fancher, James M.
Fichandler, Philip D.
Flynn, Billie U.
Forester, Sam G.
Glazener, Walter W.
Hall, Hoyt C.
Harrell, Wilson H.
Hayes, Thomas A.
Hicks, Warren H.
Irby, Leonidas E.
Irvin, Willis H.
Isbell, William J., Jr.
Jordan, Edward M.
Kaminis, Clinton N.
Lee, Robert E.
Lindsey, Walter L.
London, Jack
Meadows, Marion E., Jr.
Moore, William L.
Morgan, Harry H.
Nowlin, Charles L.
Poitevint, Coy H.
Pope, Eugene J.
Putney, William W.
Quilty, Mark A., Jr.
Riddle, John T.
Spence, William E.
Stafford, Alfred L.
Stearns, Joseph T.
Thrasher, John P., Jr.
Turner, Albert U.
Weissinger, William W.
Whitney, George D.
Williams, Josiah McK.
Young, Leonard E.
Young, Lester B.

Iowa State College

At the commencement exercises of Iowa State College, on Mar. 19, 1943, Dean Charles Murray presented the following candidates for the degree of Doctor of Veterinary Medicine:

Anderson, Garnn O.
Banks, Robert C.
Becker, Leo F.
Brager, Richard C.
Brown, Russell W.
Calhoun, William H.
Crundwell, J. Bradley
Dorsey, Terrance A.
Dykstra, Clarence F.
Fisher, Lester E.
Fistler, Ray P.
Flickinger, Milton R.
Gray, Dean H.
Griebie, Keith E.
Griffiths, Henry J.
Haught, Paul M.
Hill, James K.
Hylton, Jack W.
Irvine, Robert D.
Johanson, Lawrence V.
Karber, Melvin W.
Kirkpatrick, Robert J.
Kitchell, Ralph L.
Klett, Wilbert M.
Loften, Robert D.
Loucks, Joseph L.
Ludgate, Thomas B.
*McGilvray, John H.
McIntire, John C.
Mackereth, Robert D.
Mannasmith, Clarence H.
Marsh, Herbert L.
Melles, Leonard H.
Miller, Willis L.
Morgan, Richard B.
Nelson, Albin J.
Norden, Carl J., Jr.
O'Hara, John L.
Penkert, Richard A.
Pennings, Arthur W.
Quigley, Joseph S.
Rafoth, Leslie J.
Rawson, Donald W.
Reppert, Ray
Reppert, Roy E.
Rhodes, James D.
Rossing, Tedmar D.
Savage, Robert E.
Schweim, Erich A.
Skamser, Leonard M.
Smith, Philip Eugene
Spaulding, Donald L.
Stepp, Forrest A.
Swain, Lyle W.
Thompson, Floyd W.
Vande Garde, Gerald C.
Wahl, Robert C.
Winslade, Jack L.
Young, Robert McD.

*Degree conferred August, 1942.

William Howard Calhoun was the honor student in veterinary medicine, winning the George Judisch award. The winners of the G. G. Graham awards, which are based upon the records of the students' work in clinical practice, were: first prize, J. Bradley Crundwell; second prize, Herbert L. Marsh.

The degree of Master of Science was granted to Henry Conner Gabel (B.S., D.V.M.), with a major in Veterinary Surgery-Veterinary Pathology.

Michigan State College

At the commencement exercises of Michigan State College, on Mar. 15, 1943, the following students, presented by Dean Ward Giltner, received the degree of Doctor of Veterinary Medicine:

Appelhof, William K.
Auker, Joe A.
Beebe, Gerald J.
Beebe, Raymond
Benson, Herbert Jay
Besancon, Frederick W.
Blume, Ervin Virgil
Carlson, Paul A.
Chapel, Donald F.
Connaughton, Harold
Corrie, Garth
Creeswell, Richard A.
Culham, Merrill E.
Decker, Norman K.
Doll, Elvis R.
Ellis, David J.
*Etchison, Kenneth L.
Feldman, Henry F., Jr.
Ferguson, Frederick
Foster, Howard K.
Holtz, Fred
Hornbacker, Vern G.
Jeffery, George
Kaser, Clarence L.
King, Harold C.
Kinne, Harry W.
Kosht, Duane L.
Luoto, Lauri
McAfee, John
McLeod, Kenneth L.
Moore, Donald L.
Morris, John H., II.
Morse, Wendell, C.
Munro, Harry R.
Myhers, Palmer S.
Neuhauser, Maurice D.
Osborn, Lee H.
Quinn, John F.
Ritchie, James R.
Segal, Dorothy
Sheets, Waynard R.
Shillinger, Robert B.
*Starkey, Arthur L.
Stoe, Lysle Arnold
Ten Broeck, Charles W.
Vander Wall, Edwin R.
Wheeler, James E.
Wilson, J. A.
Wood, Ivan H.
Woodward, John B.
Wright, Betty J.

The Michigan State Veterinary Medical Association prize of $25.00 for high scholarship was awarded to Fred Holtz. The Michigan State Faculty prize of $25.00 for high scholarship for the previous year's freshman veterinary student was awarded to Harold S. Bryan. The "Rommy Steensma" award of $25.00 provided by members of Steensma's class was presented to Ervin Blume by Mrs. Rommy Steensma. Steensma was the first casualty from Michigan State College in the War. He

*July 31, 1942 graduates.

was awarded the degree of Doctor of Veterinary Medicine posthumously on Mar. 15, 1943, but as of June, 1941.

Ohio State University

At the commencement exercises of the Ohio State University, Mar. 19, 1943, Dean O. V. Brumley presented the following candidates for the degree of Doctor of Veterinary Medicine:

Abbott, William L.
Bailey, Robert M.
Blair, Albert R.
Bremer, Louis H.
Burton, Arthur A.
Chehayl, Clarence J.
Clark, Robert P.
Claugus, Frederick W.
Cole, Clarence R.
Converse, James M.
Dahmen, John R.
Duber, Anthony G.
Faulkner, Harold W.
George, John H.
Graham, Laverne P.
Grundish, Roger W.
Hall, Howard H.
Hawley, Daniel W.
Heinsen, Paul B.
Henthorne, Robert D.
Hodesson, Samuel
Hollingshead, Ervon E.
Junk, Dick
Krantz, Elden C.
Lamb, Hugh
Little, Robert D.
Mainwaring, Glyndwr T.
McClarren, Richard
McQuown, Paul F.
Meisinger, Fred H.
Miller, Robert R.
Milton, Charles S.
Montgomery, Charles W.
Newton, William H.
Nickerson, John H.
Oldham, William R.
Patton, Clyde A., Jr.
Peck, Edsell C.
Priestley, Archie C.
Ripley, Richard A.
Ross, Walter E.
Rumpler, Ward V.
Schoonover, Hobart D.
Southard, Francis I.
Spanabel, John J.
Sprowl, Raymond W.
Stout, Robert W.
Tornes, William A.
Tossey, Carrol P.
Traphagen, Douglas Van V.
Vollmer, John H.
Voss, Robert F.
Walters, Ralph D.
Weight, Thomas H.
Weil, Fred
Welbourn, Russell W.
Winkler, Jack E.
Wynkoop, Judson R.

University of Pennsylvania

At the commencement exercises of the University of Pennsylvania on Apr. 3, 1943, George A. Dick, Dean of the School of Veterinary Medicine, presented the following candidates for the degree of Doctor of Veterinary Medicine:

Abramson, Joseph
Berkelhammer, Albert M.
Brown, Joseph F.
Collins, Daniel J.
DeMott, Thomas
Detweiler, Jonas W.
Doolittle, Herbert S., Jr.
Downhill, Wallace J.
Elting, Stewart E.
Folling, Bjarne N.
Fridirici, Ira M.
Gardner, Harold H.
Good, Archie L.
Groveman, Joseph H.
Guss, Samuel B.
Hall, Jonathan P.
Hickman, George R., Jr.
High, William P.
Hitchner, Stephen B.
Hornaday, Wayne A. Jr.
Iobst, Floyd M.
Keeler, John R.
Knipe, Hesser
Kutish, Edward S.
Larson, Howard S.
Lippincott, John E.
Liscomb, John M.
Mattern, George W.
Norris, Henry W.
O'Keefe, Francis A.
Osen, Edwin J.
Power, Francis E.
Ross, Morris H.
Ryan, Edward T., Jr.
Shellenberger, James M.
Simington, Joseph O.
Slider, Howard B., Jr.
Sperling, Francis G.
Stefanick, Jack E.
Strittmatter, Thomas P., Jr.
Swartz, Abraham L.
Swope, Robert E.
Thompson, William B.
Thorp, Albert D.
Wade, George N., Jr.
Waple, Marshall J., Jr.
Weber, Robert B.
Whitlock, James A.
Yaros, Everett

Ira M. Fridirici received the J. B. Lippincott prize of $100.00, given to the member of the senior class who has attained the highest general average in examinations during the four years, and the 1930 Class prize of a book, awarded to the senior obtaining the highest average in the courses in surgery. Samuel B. Guss received the Jeannette Blair prize of $50.00, awarded to the member of the senior class who has done the best work in the small animal clinic. Stephen B. Hitchner received the Leonard Pearson prize, awarded to the member of the senior class who, in the judgment of the faculty of the School of Veterinary Medicine, is best qualified, and the Arthur D. Goldhaft prize of $50.00, offered to the senior who prepares the best written essay on "The Care of Poultry and Their Diseases."

U. S. GOVERNMENT

Holm Succeeds Rogers as Chief of Dairy Research Laboratories

Dr. George E. Holm, biochemist in the U. S. Bureau of Dairy Industry since 1920, was recently appointed chief of the Bureau's Division of Dairy Research Laboratories to succeed Dr. Lore A. Rogers.

Dr. Rogers, who retired August 1, 1942, had completed more than forty years of government service—all of it in dairy-research work in the U. S. Department of Agriculture. Under his direction, the Division of Dairy Research Laboratories built up a noteworthy backlog of fundamental dairy information, much of which is now helping to meet the changes required in the wartime production and handling of dairy products.

Dr. Holm received his formal education at Carleton College (B. S., '14) and the University of Minnesota (M.S., '16, Ph.D. '19). He came to the Bureau of Dairy Industry in 1920.

Dr. Holm has made numerous contributions toward a better understanding of the chemistry of milk and related subjects. The results of his work have been useful in many instances in

devising practical methods of prolonging the keeping quality of dairy products, and other foods as well, particularly those containing fats. He was the recipient of the 1942 Borden Award for outstanding research in the chemistry of milk.

Axis Technical Books Available for Republication

The Office of the Alien Property Custodian announced on March 24, 1943 that four hundred titles of individual technical books and sets of books of Axis origin are available for republication in furtherance of the war effort. Their titles were suggested by leading American scientists and librarians. Included among the titles are volumes on aviation, medicine, gas warfare, oceanography, physics, chemistry and other technical subjects.

Copyright interests in these works will be vested by the Custodian in publishers to be licensed for the purpose of having them republished as an aid to scientific research allied with the war effort. The Custodian will seek reproduction and distribution of such works through normal publishing channels by American publishers under licenses to be granted on May 1.

Copies of the listings of works are available at the office of the Alien Property Custodian, Washington, together with a detailed statement of the policy which will be followed.

WPB Allocates Chemicals for April

On April 13, WPB made public the monthly distribution of chemicals under allocation orders. Over 47 per cent of the value of these entered into identifiable military production. Among the civilian uses to which the various chemicals were allotted, the percentage tabulations included:

Ascorbic acid: granted in full for veterinary medicine; granted in part (50%) for food and milk; allocation for civilian medicinal uses was based on 100 per cent of requests, adjusted to 1942 use.

Bismuth chemicals: granted in full for medicinal use.

Caffeine: granted in full for medicinals.

Dichlorethyl ether: granted in full for insecticides, cleaning compounds and anesthetics.

Glycerine: For drugs and pharmaceuticals, from 60 to 100 per cent of requests were granted, depending upon use.

Phenol: granted in part for medicinal salicylates (70% of 1941 production); other medicinals, 63 per cent; disinfectants and preservatives, 32 per cent.

Pyrethrum: Sole civilian allocation was for agricultural purposes and distribution made according to recommendations of Food Production Administration.

Pyridine: granted in full for sulfa drugs.

Rotenone: distributed according to recommendations of Food Production Administration.

New Insecticide Dispenser for Army Use

A simple, metal container-dispenser for insecticides, which makes spraying equipment unnecessary has been developed by Westinghouse engineers with the guidance of the Surgeon General's Office of the Army. Each dispenser or "health bomb" is loaded with one pound of a liquid insecticide which can be discharged at will in a fine mist that is fatal to mosquitos and flies, but harmless to man. The insecticide was developed by Dr. Lyle D. Goodhue, U. S. D. A. chemist.

Only three seconds is required to fumigate a pup tent; one dispenser will fumigate 240 pup tents, 50 giant bombers or 150,000 cubic feet of space. The equipment is designed as a protection against insect pests for our armed forces in tropical jungles especially and gives them a new weapon against malaria and yellow fever. The insecticide used is effective against flies, mosquitos, ants and cockroaches, and tests are under way to determine its effectiveness against other forms of insect life.

The dispenser is of the throw-away type, about the size of an ordinary tin can. The facilities of the Westinghouse plants are being expanded to permit supply of dispensers at the rate of ten thousand per day.

AMONG THE STATES

California

Lt. Helen M. Robertson of North Hollywood, the only veterinarian so far in the W.A.A.C., is assigned at present to the inspection of food at Ft. Des Moines, Iowa. Lt. Robertson is a member of the Royal College of Veterinary Surgeons of London, having received her degree in 1938.

Come now! Do you think you are doing a good job of helping to keep up the morale of this man?

District of Columbia

Personal.—Mrs. Dora Flading Robinson, widow of Dr. C. Barnwell Robinson, veterinarian for the District of Columbia for thirty-three years until his death in 1921, died at her home in Washington, D. C., on March 23, 1943.

Dr. Robinson was the founder of the United States College of Veterinary Surgeons in 1894, and after his death Mrs. Robinson provided for the continuance of the college until its closing in 1927. At the close of World War I, a large number of veterinarians were educated at this institution as a part of the program for rehabilitation of veterans. Mrs. Robinson is survived by a daughter, Mrs. Carrie B. Smith, and two sons, B. Jabel Robinson, a veterinarian, and Joseph F. Robinson, a civil engineer.

New Jersey

Personal.—The Roselle Park Animal Hospital in Roselle Park has been purchased recently by Dr. Mac Rachman.

Illinois

President Bott Sends a Message.—Members of the Illinois State Veterinary Medical Association recently received the following message from their president, A. E. Bott of the Corn Belt Serum Company, East St. Louis:

> A friendly pat on the back, a hearty handshake, a kind word of encouragement, a sincere offer of helpfulness—all these make life worth while. That is what so many of you have done for me. Your inspiriting offer of support makes my heart glad.
>
> At a time when we are being kept busy to meet the increasing demands of our nation at war, it is fitting that we should think sometimes about the total fact of our future. In concentrating the war effort, restrictions have been placed on many public meetings, yet the principles of our war effort are so closely associated with human need that it should be our purpose to keep the veterinary profession "association conscious"—a consciousness full of sacrifice, courage and a determination vital to our professional life as well as to the people we serve.
>
> The basic strength of any nation at war or peace depends upon a lasting food supply. The seriousness of the disease-threat to animal life commands a well planned advancement in veterinary science. We must keep alive the educational phase which our association offers. We must spread the spirit of veterinary service with the fearlessness that comes from an abiding and righteous hope.
>
> We veterinarians and Americans all can look to the future with inborn assurance that right makes might, and that justice and freedom will predominate. Let us affirm our faith in the teachings of our profession. We must triumph!
>
> I hope each of you will enlist as a progressive and active member of our association during this year—your suggestions are solicited.
>
> Sincerely yours,
>
> s/ANTHONY E. BOTT, *President.*

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Former assistant to the editors of the journals of the American Veterinary Medical Association (1939-1942), Lt. J. J. Shaffer is stationed at Camp Carson, Colorado. He is in the medical administrative corps, and is assigned to a medical unit now training for overseas duty.

Lt. J. J. Shaffer

Iowa

Southwestern Iowa Association.—The regular semi-annual meeting of the Southwestern Iowa Veterinary Medical Association was held at the Hotel Chieftain, Council Bluffs, April 6, 1943. The following program was presented throughout the day and evening.

W. E. Peterson, professor of dairy husbandry, University Farm, Minn.: "Bovine Lactation in Health and Disease", and "Nutrition in Dairy Animals with Present Protein Shortage".

J. R. Hay, Omaha, Neb.: "The Use of Sulfa and Other Drugs in Mastitis Control."

E. S. Dickey, chief, veterinary department of John Morrell & Co., Ottumwa: "Cattle

Grub Control Technique — Its Effectiveness" and "Control of Nodular Disease in Sheep".

W. T. Spencer, regional manager, Live Stock Loss Prevention Board, Lincoln, Neb.: "The Poultry Disease Control Program in Two Nebraska Counties".

E. M. Rundahl, inspector, United States BAI, Omaha, Neb.: "Personal Experiences in Occupied France". Dr. Rundahl was one of the first American veterinarians to arrive in France in World War I. After the war, he made France his home until the invasion of 1941.

E. A. Kelloway, secretary of the Omaha Live Stock Exchange: "Current Situation Affecting Live Stock Production".

J. A. Barger, president, Iowa Veterinary Medical Association, Des Moines: "Specific Wartime Duties of the Profession and Association".

T. E. Anderson, Bedford: "Clinical Reports on the Use of Sulfa Drugs in Veterinary Practice".

C. C. Franks and **J. A. Barger** conducted a round table discussion on "The Brucella Vaccination and Bang's Disease Control Problem".

Frank B. Young, Waukee, conducted a "Bovine Question Box".

W. E. Peterson, University Farm, Minn., and **A. M. Quin,** head, department of clinical veterinary medicine, Jensen-Salsbery Laboratories, Kansas City, Mo., discussed: "Stilbestrol—Physiologic Considerations and Reports on Clinical Use".

F. S. Sharpe, Ute: "Hints on Swine Practice".

W. D. Cotter, Tabor: "Swine Question Box".

• • •

Cedar Valley Association.—Thirty-six veterinarians from 19 counties attended the meeting of the Cedar Valley Veterinary Medical Association, which convened in Black's Tea Room, Waterloo, March 8, 1943. The following program was presented:

J. D. Ray, pathologist, Omaha, Neb.: "Pseudo-Rabies or Mad Itch of Cattle".

A paper which appeared in *Science* entitled the "Immunity in Virus Diseases" by the eminent authority, Thomas M. Rivers, M. D., of the Rockefeller Institute for Medical Research, was read. Mimeographed copies were furnished by the Eastern Iowa Veterinary Medical Association to each veterinarian for further study.

G. R. Allen, Conrad, conducted a question box on the use of stilbestrol in sows and boars, with case reports by **P. V. Neuzil** of Blairstown and **Joe W. Giffee** of Cedar Rapids. Other subjects discussed were treatments for de-grubbing of cattle, lameness in feeding lambs and young bulls; allergy and acetonemia in cows; and sores on cow's teats.

C. C. Franks, state veterinarian, Des Moines, addressed the meeting on the subject: "The Legal Disposal of Carcasses of Animals on the Farm".

• • •

East Central Iowa Association.—The East Central Iowa Veterinary Medical Association meeting was held in the Hotel Tipton, Tipton, March 11, 1943, with 36 veterinarians present from 11 counties. The speakers and their subjects were:

I. H. Borts, M.D., associate director, State Hygienic Laboratory, University of Iowa, gave an interesting and instructive discourse on rabies.

Ben H. Peterson, professor of chemistry, Coe College, Des Moines: "Sulfa Drugs, the Modern Miracle".

F. J. Crowe, Iowa City, and **Joe W. Giffee,** Cedar Rapids, described the use of sulfa drugs in hemolytic streptococcus infection in swine.

R. M. Hofferd, Cedar Rapids, read a paper on "Immunity of Virus Diseases" by Thomas M. Rivers, M.D., of the Rockefeller Institute for Medical Research, which appeared in *Science*. **Chas. E. Bassler** of Ainsworth led the discussion.

Kansas

Kansas State College Alumni.—Dr. Ching Sheng Lo ('23), c/o Bureau of Animal Industry, South Gate, Chengtu, Szechuen, China, in a letter to a staff member written July 15, 1942, but not received until early in February, 1943, states that the Chinese are more confident than ever of a victorious outcome of their struggle with Japan. Doctor Lo is doing a good deal of clinical work including the treatment of pet animals and goats. He finds many parasitic diseases in these animals.

Dr. Funk Kuan Huang, ('39) has had a varied veterinary experience since his graduation, including association with the Hooper Foundation for Medical Research in San Francisco. Recently, because of the growing demands of his family, he has resigned this position, and has started a poultry farm on which he has an excellent collection of White Leghorn and New Hampshire Red poultry. We wish him success in his undertaking.

Maine

State Association.—The regular meeting of the Maine Veterinary Medical Association was held at the Elmwood Hotel, April 14, 1943. In the early afternoon a clinic was held at Dr. Alton Richardson's hospital. Dr. Sidney Stiles performed an enucleation of the eye in a dog. Later at the hotel, a business meeting convened and practice problems were discussed. In the evening, a dinner at the hotel in honor of Dr. Sherman Cleaves was well attended, after which the following program was presented:

P. A. Campbell, Eastern States Farmers' Exchange: "Nutrition in Large Animals as Influenced by the War".

E. R. Frank, Kansas State College, Manhattan: "Bovine Surgery". (Motion picture.)

s/J. F. WITTER, *Secretary-Treasurer.*

New York

New York City Association.—The Veterinary Medical Association of New York City held its regular meeting in the grand ballroom of the Hotel New Yorker, April 7, 1943. The business meeting was postponed until the May meeting.

John Tee-Van, curator and executive secretary of the New York Zoölogical Society, was the speaker on the absorbing subject, "Thirty-five Thousand Miles for Madam Chiang Kai-Shek's Panda," a first hand story about the Giant Pandas now exhibited at the Bronx Park Zoo. The meeting was well attended by members and guests.

s/C. R. SCHROEDER, *Secretary.*

North Carolina

The Fifth Annual Conference.—The Fifth Annual Conference for graduate veterinarians held at State College, Jan. 26-29, 1943, was a distinct success with 60 North Carolina veterinarians attending. Dr. C. D. Grinnels and his corps of helpers deserve much praise for this fine piece of work which brought the following noted veterinarians to the conference: W. W. Dimock, University of Kentucky, Louisville; D. H. Udall, Cornell University, Ithaca, N. Y. and J. A. Campbell, Toronto, Can.

• • •

Roanoke-Tar Association.—The Roanoke-Tar Veterinary Medical Association met at Rocky Mount on March 5, 1943, with an attendance of 30 veterinarians from eastern North Carolina. **A. C. Yow** of Henderson was elected president and **J. W. McKee** of Snow Hill was re-elected as secretary.

s/J. H. BROWN, *Secretary-Treasurer.*

Ohio

Personal.—Dr. Charles H. Herrold, Indianapolis, Ind., has retired from the United States Bureau of Animal Industry. He began his new work as inspector of hotels and restaurants at Dayton, Ohio, Feb. 1, 1943.

Pennsylvania

The Beta Chapter of the honorary fraternity, Phi Zeta, held its annual induction banquet at the University Club, Philadelphia, on Feb. 27, 1943.

Those taken into membership included Ernest W. Hogg, chairman of the State Preparedness Committee, Wilkes-Barre, Pa.; Frederick Boerner, graduate school, University of Pennsylvania; Evan J. Van Tilborg, veterinary school faculty, University of Pennsylvania. Of the senior class, the following were admitted: Hesser Knipe, Bjarne N. Folling, George N. Wade, John E. Lippincott, Thomas DeMott, Herbert S. Doolittle. Junior class members included were: John T. McGrath, Ellsworth Dougherty, 3rd.

s/RAYMOND C. SNYDER, *Secretary.*

State Board Examinations

Massachusetts—The Massachusetts State Board of Veterinary Examiners will hold examinations for registration in veterinary medicine May 18-19, 1943 at the State House, Boston, Mass.

North Carolina—The North Carolina Board of Veterinary Medical Examiners will meet at Hotel Carolina, Raleigh, N. Car., at 10 a. m., June 23, 1943, to examine applicants for license to practice veterinary medicine. P. C. McLain, R. 1, High Point, N. Car., secretary-treasurer.

COMING MEETINGS

Connecticut Veterinary Medical Association. Bond Hotel, Hartford, Conn., May 5, 1943. Geo. E. Corwin, 19 Frederick St., Hartford, Conn., secretary-treasurer.

District of Columbia Veterinary Medical Association. Meeting on May 11, 1943, Mayflower Hotel, Washington, D. C. W. M. Mohler, 5508 Nebraska Ave., N.W., Washington, D. C., secretary.

Michigan State Veterinary Medical Association. Michigan State College, East Lansing, Mich., June 23-24, 1943. B. J. Killham, Department

of Animal Pathology, M.S.C., East Lansing, Mich., secretary.

North Carolina State Veterinary Medical Association. Forty-second annual meeting, Hotel Carolina, Raleigh, N. Car., June 23-24, 1943. J. H. Brown, Tarboro, N. Car., secretary-treasurer.

American Veterinary Medical Association. Hotel Jefferson, St. Louis, Mo., Aug. 25-26, 1943. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago, Ill., executive secretary.

Eastern Iowa Veterinary Medical Association. Hotel Montrose, Cedar Rapids. Oct. 12-13, 1943. R. E. Elson, Vinton, Iowa, secretary.

American Public Health Association (1790 Broadway, New York City). Wartime Public Health Conference, New York City, Oct. 12-14, 1943. Seventy-second annual business meeting of the Association will be held in connection.

Pennsylvania State Veterinary Medical Association. Penn Harris Hotel, Harrisburg, Pa., Oct. 21-22, 1943. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia, Pa., secretary.

Meetings Postponed or Cancelled

Houston Veterinary Medical Association. Archie Stallings, 801 Waugh Drive, Houston, Texas, secretary. Meetings for the Houston Association have been postponed for the duration.

South Dakota Veterinary Medical Association. J. T. McGilvray, R. R. No. 3, Sioux Falls, S. Dak., secretary-treasurer. Meetings for the South Dakota Association have been postponed for the duration.

Virginia State Veterinary Medical Association. E. P. Johnson, Box 593, Blackburg, Va., secretary. Summer meeting cancelled.

Wisconsin Veterinary Medical Association. B. A. Beach, University of Wisconsin, Madison, Wis., secretary. Annual (winter) meeting cancelled.

Mississippi Veterinary Medical Association. H. C. Simmons, Brookhaven, Miss., secretary-treasurer. The 1943 meeting has been postponed indefinitely.

MARRIAGES

Capt. Alvin F. Sellers (U.P., '39), Fort Sam Houston, Texas, to Dorothy Mickey, Mason City, Iowa, Nov. 21, 1942.

Lt. James J. McCarthy, V.C. (Corn., '39) of Miami Beach, Fla., to Ruth Crimmins, of Harrisville, N. Y., on Mar. 29, 1943.

DEATHS

Augustus S. Cleaves (McG., '93), 74 years old, Gardner, Mass., died Mar. 31, 1943. A member of the Massachusetts Veterinary Association since 1896, he was president of that association in 1911. He joined the AVMA in 1928.

O. D. Grinstead (K.S.C., '16), 62 years old, Centralia, Mo., died Feb. 28, 1943. He had practiced in Centralia since his graduation and had also served as deputy state veterinarian.

John D. Jones (C.V.C., '10), 69 years old, Providence, R. I., died Mar. 10, 1943. Following graduation, Dr. Jones located in Providence. He served with the 26th Division in World War I, resuming practice after the war. He joined the AVMA in 1938.

Eric Osell (C.V.C., '10), died Feb. 14, 1943, at Lafayette, Minn., where he had practiced for the past twenty-three years.

Maurice Ray Powers (N.Y.-A.V.C., '06), Norwalk, Conn., died Aug. 14, 1942. He had been a member of the AVMA since 1913.

Burdette D. Radcliffe (C.V.C., '08), 59 years old, New Britain, Conn., died Feb. 4, 1943. Dr. Radcliffe established a practice in New Britain, shortly after graduation, which he maintained until about ten years ago. In 1915, he was appointed municipal meat and food inspector and continued in that position until his death, a period of nearly twenty-eight years. He was a member of the Connecticut Veterinary Medical Association and of the New England Veterinary Association.

William D. Staples (C.V.C., '05), 61 years old, Anniston, Ala., died Jan. 3, 1943. In addition to his practice in Anniston, Dr. Staples was assistant state veterinarian. He joined the AVMA in 1908. His son Wilfred W. Staples, has taken over his practice.

W. H. Tuck (K.C.V.C., '05), 82 years old, Weeping Water, Neb., died Mar. 14, 1943. Dr. Tuck was a former mayor of Weeping Water, had been secretary of the Nebraska Veterinary Association for many years, and had served for twelve years on that association's examining board.

Every soldier has his duty; so has every dollar —Buy Bonds. Every dollar beyond the actual cost of living belongs in a Second War Loan Bond uniform.

How the Nazis Finance Their War

By STEFAN HEYM

Imagine yourself suddenly transplanted into a German factory — anywhere in Germany. Imagine you hear the whistle screaming: 12 Noon. You have twenty minutes for lunch. Pale and grimy, overworked and underfed men and women push toward the doors of the halls to catch a bit of fresh air in the yard.

Suddenly a commotion—angry voices growing louder: "The doors are locked!" Uniformed SS-Guards, well-fed, well-clothed, well-shod, have taken up posts at the doors—two to each door. Their blooming health is in cruel contrast to the deep-lined pallor of the workers.

What is this? . . . a raid? Does the all powerful Secret State Police suspect that some of the men and women working here are not as enthusiastic about the war as Hitler would like them to be . . .?

Then the loudspeakers begin to boom.

It is just a collection. The slick voice of the little Doctor, Goebbels, riling the people. Once more, the Winter-Help campaign is opened.

The Guards come around with tin-cans and lists. You sign up and you pay up. You had better. You're lucky, to be working for pay. In the concentration camp, they don't pay at all.

The Winter-Help drive is a seasonal squeeze under the guise of charity. The money, of course, is not used for charitable purposes but to swell the Nazi war chest.

Other, more important deductions are forced from the people throughout the year.

For instance, Hitler boasts that he eliminated unemployment in Germany years ago. Yes, there are no unemployed — Hitler converted them into soldiers. Nevertheless, up to this date, six percent and more of the German workers' and employees' pay is deducted "to help support the unemployed."

Large deductions are made for the Nazi "Arbeitsfront," a nation-wide company union in which the members have no rights, but which serves as a means of check-up for the Gestapo.

Is Seasonal Squeeze

The most outrageous Government skullduggery, however, is the installment payment plan for the "Volkswagen", the people's car. Several years ago, with great fanfare, a drive was launched to secure for every racially and otherwise pure German workman a people's car, to be built in special people's car factories. The people were ordered to pay, in advance, installments for the promise that a spic and span people's car would be theirs—at some future date. The factories were built all right—but no German worker ever saw his Government car. Outside of a few samples, which were given to Nazi functionaries, the factories have turned out tanks. But the people still pay their installments on the "people's car".

These several deductions are aside from stupendously high income taxes, compared to which ours are peanuts. Nevertheless, most Germans have some money left over and above taxes and "charities". The reason for this is simple: There is very little to be bought since everything is rationed, and even the allotted goods are seldom available. Therefore, the Nazi Government exerts pressure, by its usual methods, to make people put their surplus cash into savings banks. This having been achieved, the Nazi Government "borrows" the money—that is, confiscates it—from the banks.

All this amounts to a ruthless credit inflation which expresses itself in skyrocketing prices, the lowering of real wages, and a general decay of living standards. For the Nazi Government, the finance question is after all not a major problem. It does not have to back up its currency with any real value, as long as it can back it up with the machine guns of the Gestapo.

Yet, in spite of all their power, the Nazis have not dared to call for a *voluntary purchase* of War Bonds. There are no German War Bond issues for the people—to ask the people to buy Nazi War Bonds voluntarily would have amounted to a plebiscite on the war, a plebiscite which the Nazis did not dare to face.

These men were trained with money your War Bonds represent, and they thank you for it.

In the United States, on the other hand, we are proud to support voluntarily our country and our Government in this hard struggle against the Fascist aggressors. We know what is at stake. We ourselves determine directly the percentage of payroll deductions for the purchase of War Bonds; or should we be independent, we determine the amount of War Bonds we want to buy outright. And through Congress, we determine to what use this money is to be put.

We believe in our strength and our victory, and we know that the money we invest in our country will be paid back to us with interest. The German people, however, no longer believe in a Nazi victory—that is why the Nazis must resort to trickery and brute force to make the German people and all enslaved European nations pay for Hitler's war.

Stefan Heym is a young German writer who escaped from that country after Hitler came into power. At that time employed by a Democratic, anti-Nazi paper, he fled to Prague. Later he was brought to this country on a scholarship by the University of Chicago, took his Master of Arts degree there and returned to New York to found an anti-Nazi, German-language weekly newspaper. His recent book, "Hostages," has been a best-seller.

THE VETERINARY PROFESSION AND THE WAR

Procedure of Processing Physicians, Dentists and Veterinarians in the Field

The War Department Service of Supply, Officer Procurement Service, issued the following memorandum under date of February 27, covering the procedure for processing physicians, dentists and veterinarians in the field:

NOTE.—*This memorandum both restates prior instructions and contains new instructions. Immediate attention to its provisions is essential to field office work.*

1. *Scope of Memorandum; Rescission of Prior Instructions.—a)* This memorandum states the procedure under which Officer Procurement Service will assist the Surgeon General in processing physicians, dentists and veterinarians for appointment as officers in the Army of the United States. The procedure here stated is approved for the processing and appointment of physicians, dentists and veterinarians only and does not apply to the processing and appointment of candidates for any other position for the Surgeon General.

b) Prior instructions still in effect have been consolidated in this memorandum. Accordingly FT-15 (January 13) and attached memorandum, FT-17 (January 18), FT-24 (January 27), FT-29 (February 11), FT-31 (February 17), FT-33 (February 22) and all other instructions in this connection are hereby rescinded.

2. *The Surgeon General's 1943 Recruiting Program.—a)* The 1943 program of the Surgeon General for the appointment of qualified individuals from civil life in the Medical Corps, Dental Corps and Veterinary Corps includes not only physicians, dentists and veterinarians established in their communities but also medical interns and residents of hospitals. This program is as follows:

	Hospital Interns and Residents	Others	Total
Physicians	3,000 approx-	6,900	9,900
Dentists	0 imately	4,800	4,800
Veterinarians	0	900	900
	3,000 appr.	12,600	15,600

The requirements of the Air Surgeon are included in the foregoing.

b) The monthly objective for appointments of those other than from the hospital intern and resident category is as follows:

Physicians, Medical Corps.....	575
Dentists, Dental Corps.....	400
Veterinarians, Veterinary Corps	75
	1,050 per month

c) The objective for appointments from the hospital intern and resident category cannot be readily stated in monthly quotas. Most internships terminate about June 30. Whereas small numbers of interns and residents may be available in all months, the bulk of the processing in this category should come during May, June and July. The number of hospitals in the eastern part of the United States being greater than elsewhere, the number of cases in this category to be processed in the East will be proportionately greater.

d) All cases included within the Surgeon General's program here outlined will be dealt with in accordance with the procedure stated in this memorandum.

NOTE.—During the years prior to 1943 the Medical Department commissioned many students and interns in the Medical Administrative Corps, A. U. S. These individuals have remained on inactive duty status pending completion of their medical education. Also medical, dental and veterinary students and interns who have previously been commissioned and now hold appointments in the Officers' Reserve Corps, in other branches, have been similarly deferred from active duty. During 1943 the existing commissions of these individuals may be terminated at their own request, under certain circumstances, and, when qualified, these individuals may be appointed as officers in the Medical, Dental or Veterinary Corps. Officer Procurement Service has no processing or other function in regard to such appointments. The appointment of individuals referred to in this note will be handled by the individuals directly with the Surgeon General. Inquiries in regard to such appointments should be referred to the Procurement Section, Military Personnel Division, Office of the Surgeon General of the Army, 1818 H Street N.W., Washington, D. C.

3. *States from Which Physicians, Dentists and Veterinarians Will Be Recruited.—a)* 1) Physicians will be procured in the following states: California, Colorado, Connecticut, Dis-

trict of Columbia, Illinois, Iowa, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont and Wisconsin.

2) The following states have already contributed more physicians to the armed forces than the sum of their 1942 and 1943 quotas and will not be called on to furnish any more physicians, except interns and residents and except special cases for specific position vacancies, during 1943: Alabama, Arizona, Delaware, Georgia, Idaho, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, South Carolina, Tennessee, Texas, West Virginia and Wyoming.

3) In states not listed in either *a* 1) or 2) there will be at present no procurement of physicians, except interns and residents and except special cases for specific position vacancies.

b) There will be no procurement of dentists, except special cases for specific position vacancies, in Alabama, Arizona, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia.

c) There are no restrictions at present on recruiting veterinarians.

4. *Function of Officer Procurement Service.*—*a*) Officer Procurement Service will process the papers of all physicians, dentists and veterinarians whose availability for commissioning in the Army of the United States has been determined by the War Manpower Commission (see paragraph 5) and will transmit to the Secretary of War's Personnel Board requests for appointment of such individuals, submitted by the Surgeon General.

b) Officer Procurement Service has no function to perform until an officer procurement district office has received from the War Manpower Commission a determination of availability of a physician, dentist, or veterinarian. See paragraph 6.

c) The district office will interview each candidate for character, integrity, reputation and qualification for commissioning as an officer. The investigation will be limited to these subjects and will not extend to an appraisal of professional qualifications. A form OPB-2 (completed as to the side containing the interviewer's remarks) will be included with the candidate's file when forwarded to the Surgeon General. (The other side of the form need not be completed.)

d) The Surgeon General has discontinued all medical officer recruiting boards. In certain service commands, officer procurement district offices may find it desirable to arrange, in investigating candidates, for assistance from the chief of the medical branch in the service command.

e) District offices will not forward to the Surgeon General any papers concerning unavailable physicians, dentists or veterinarians, except as requested by higher authority. Questionnaires and related papers of unavailable physicians, dentists and veterinarians, if any, should be retained in the District office's inactive file pursuant to FP-14, Feb. 3, 1943, paragraph 6 *c*.

f) Inquiries to a district office by physicians, dentists and veterinarians concerning whom no determination of availability has been received by the district office should be referred to the appropriate state chairman, Procurement and Assignment Service, War Manpower Commission. See paragraph 5.

5. *Function of War Manpower Commission.*—*a*) The War Manpower Commission functions through its Procurement and Assignment Service. This service determines whether a physician, dentist, or veterinarian is "available" for commissioning in the armed forces of the United States. No physician, dentist or veterinarian may be processed for appointment or appointed in the Army of the United States unless and until his availability has been so determined.

b) In each state the Procurement and Assignment Service has set up three state chairmen: medical, dental, veterinary. Attached hereto, marked Tab A, is a schedule showing for each state the authorized chairmen, and their co-chairmen and vice chairmen, if any (herein called "state P and A chairmen").

c) Each state P and A chairman prepares a monthly quota list of physicians, dentists and veterinarians (as the case may be) who are apparently suitable and who are determined to be available, for commissioning in the Army of the United States. To each individual so listed, the central office of the Procurement and Assignment Service sends a communication, inviting him to apply for service with the armed forces (opportunity being afforded to indicate on the inclosed reply card preference for Army, Navy or Medical Department of the Air Forces). The reply cards are sent by the potential applicants to the appropriate state P and A chairmen.

d) On receipt from time to time by the state P and A chairmen of such reply cards, they give to Officer Procurement Service the notice of availability provided in paragraph 6.

6. *Notice of Availability Given by State P and A Chairmen.*—*a*) Notice of availability of a particular physician, dentist or veterinarian within the jurisdiction of a state P and A chairman will be given by such chairman to Officer Procurement Service on form 97 ("Availability Clearance Form") or some similar form in duplicate. Preference for service with the Medical Department of the Army Air Forces

will be plainly indicated on form 97 by the state chairman.

b) Such notice of availability will be given by the state chairman direct to the designated officer procurement district office in accordance with the schedule shown on Tab B attached. This schedule has been set up to meet the convenience of the Surgeon General and must be explicitly folfowed. A designated district office which receives a notice of availability may forward it to another district office for necessary action (for example, New York City may forward to Albany or Buffalo).

c) In the event that a notice is received by an officer procurement district office signed by other than the authorized state chairman, his alternate, or a person duly authorized by such state chairman to give notice in his behalf, the office will return such notice to the state chairman before taking action, with an explanation that only notices bearing authorized signatures can be honored.

d) No action will be taken by an officers' procurement district office in any case until receipt by it of a properly executed form 97, evidencing determination of the individual's availability. Form 97 indicating unavailability should be returned by district offices to the proper state P and A chairman without action.

e) Attention is invited to the provision of AR 605-10, paragraph 6:

> An officer of the Army of the United States must at the time of appointment be a citizen of the United States or of the Philippine Islands, or a citizen of a cobelligerent or friendly country, who otherwise possesses the same qualifications as a citizen of the United States. . . .

Any notice of availability of a physician, dentist or veterinarian who does not comply with this provision should be returned to the proper state P and A chairman without action.

7. *Processing Procedure.—a*) On receipt of notice of availability in regard to an individual physician, dentist or veterinarian, the officer procurement district office will promptly contact the individual and arange for an interview. At the same time the individual should be advised of the papers which he must furnish and the steps which he must take. See paragraph 8.

b) In areas where considerable travel is involved, district offices will endeavor to schedule visits of their officers through such areas so that applicants may be interviewed at or near their home cities. District offices are authorized to coöperate with state P and A chairmen so as to facilitate the scheduling of such visits.

c) The individual will be requested by the district office to complete all papers and take all steps required of him within fourteen days of the date of such request.

d) If no reply is received from a candidate or if a candidate declines to act as indicated, a report thereon will be transmitted by the officer procurement district office to the state chairman.

e) As soon as the candidate's processing is completed, the fully processed papers will be forwarded by air mail by the field office direct to

Procurement Section,
Military Personnel Division,
Office of the Surgeon General of the Army,
1818 H Street, N.W., Washington, D. C.

It is essential to carrying forward the Surgeon General's program that such completed papers be sent direct and not through channels.

f) If the completed papers cannot be forwarded within two weeks after the date of receiving the notification of availability, the district office will advise the state chairman of the exact status of processing. The state chairman is charged with responsibility for making further inquiry of the candidate. In the event that the district office is about to complete the processing at the end of the fourteenth day of the period, such advice to the state chairman may be omitted.

g) If a candidate's papers, on submission by the Surgeon General to Officer Procurement Service on a form OPS-3 are incomplete, they will be returned to the appropriate district office attached to a form OPS-2. When a district office receives such papers, it will take the action necessary to complete the same. On completion, the papers will be returned to Chief, Field Operations Branch, Officer Procurement Service, Washington, D. C. This is the only instance in which a district office sends papers concerning physicians, dentists and veterinarians direct to Washington headquarters of Officer Procurement Service.

h) The decision as to grade and appointment to be recommended for each candidate rests with the Surgeon General.

8. *Papers to be Furnished by Candidates.—a*) The completed file of each physician, dentist or veterinarian forwarded by a district office to the Surgeon General, pursuant to paragraph 7 *d*, should include:

1) WD AGO Form 0850, in duplicate, with passport size photo attached and each question fully answered.
2) WD AGO Form 178-2, in duplicate (Classification Questionnaire of Medical Department Reserve Officers).
3) WD AGO Form 63, in triplicate.
4) Affidavit of physical defect, in duplicate, if required.
5) Form OPB-2 (OPS interviewer's report), in duplicate. See paragraph 4 *c*.
6) Form OPB-5 (certificate of inspection of naturalization papers, if candidate is not a citizen by birth or has lost citizenship), in duplicate.
7) Federal employee—written release from federal employment, signed by responsible executive.

b) In addition to the papers listed in *a*, the completed file of each physician, dentist and veterinarian who is a graduate of a foreign

(other than Canadian) medical school should include the following or, if not available, a detailed explanation in lieu thereof, with request for a waiver:

NOTE.—Canadian medical, dental and veterinary schools are not deemed "foreign" medical schools.

1) Transcript of preprofessional education, which must be equivalent to the requirements for admission to an approved American medical, dental or veterinary school (with certified translation).

2) Résumé of the credit hours and grades received in each course at professional school; and, if more than one professional school was attended, full particulars in regard thereto.

3) Photostat of diploma which was awarded after four years' academic instruction in medicine, dentistry or veterinary medicine (with certified translation).

4) Photostat of license to practice in a state, territory or the District of Columbia (such licensure cannot be waived) or certification by an army officer on active duty that he has seen the applicant's license; also a license or registration authorizing practice in the country where professional education was obtained.

5) Certificate of approved internship of not less than one year's duration in the case of physicians.

6) If the candidate is a diplomate of the National Board of Medical Examiners, or if accepted by said board for examination, substantiating evidence.

c) In addition to the papers listed in *a*, the completed file of each physician who is a graduate of a nonapproved medical school (Chicago Medical School, Middlesex College of Medicine and Surgery and Cincinnati Eclectic School of Medicine) should include the following:

1) Letter from the dean of his medical school verifying the fact that he has satisfactorily completed a four year course of regular medicine and has been granted an M.D. degree.

2) Letter from the superintendent of a hospital verifying at least one year of rotating internship on the part of the applicant.

3) Photostat, of, or certification by, an army officer on active duty that he has seen the applicant's license to practice medicine in a state, territory or the District of Columbia. (Such licensure cannot be waived.)

4) Letter from three physicians who are graduates of an approved medical school and are practicing in the county where the applicant resides, stating that they know the applicant to be engaged in the ethical practice of medicine. Such letters should state the writer's school and year of graduation, in addition to information concerning applicant's professional qualifications.

5) Evidence of membership in his local county medical society or a letter from the secretary of the district or county medical society, substantially as follows:

Place .....
Date .....

Dr.....of.....is known to this society as a graduate of..... Medical School, located in..... He is engaged in the practice of medicine in ....., having been licensed by this state since..... He is, so far as is known, an ethical practitioner of medicine. He would be eligible to apply for membership in the.....Medical Society if he had been in practice for..... years. Having attained such membership, he would be accredited to the..... District (County) Medical Society.

Signed.....

Secretary.....(District) (County) Medical Society.

(The applicant should bring his diploma and certificate of licensure to the district or county secretary when requesting such a letter.)

d) In addition to the papers listed under *a* and otherwise required under *b* or *c*, the completed file of each physician, dentist or veterinarian who is a Canadian citizen should include the following:

1) Evidence that he has applied for his first papers as an American citizen.

2) A release from the Canadian legation.

e) In addition to the papers listed under *a* and otherwise required under *b* or *d*, the completed file of a dentist or veterinarian should include the following:

1) Photostatic copy or certified evidence of licenše to practice his profession for the current or the ensuing year in a state, territory or the District of Columbia.

2) For an individual who has graduated from dental or veterinary school in 1942 or 1943 either a license to practice or a photostatic copy of diploma or certificate of the dean of the appropriate school as to graduation.

9. *Nonrequirement of Release from Selective Service Classification II-A, II-B, or III-B.*—Notwithstanding the provisions of AR-605-10, Dec. 30, 1942, paragraph 7 *j*, to the effect that "No civilian, of any age, will be appointed if classified as II-A, II-B, or III-B unless released from such clasification by his local draft board," no such release need be obtained in the case of a physician, dentist or veterinarian whose availability has been determined by the War Manpower Commission (Procurement and Assignment Service). Neither is it required that a draft status certificate be furnished in regard to a physician, dentist, or veterinarian.

10. *Weekly Reports.—a*) Each officer procurement district office will submit to Washington headquarters of Officer Procurement Service, as of Thursday night, commencing with March 4, 1943, a report of all cases handled

under the foregoing procedure, in the form attached hereto and marked Tab C.

b) In the March 4 report district offices will break down the prior cumulative aggregates of physicians, dentists and veterinarians into the three separate categories.

c) The accuracy of the figures in the weekly report will be verified by the district office before submission, by checking as indicated on the form (Tab C).

d) Notices of availability concerning physicians, dentists and veterinarians which are received by officer procurement districts designated to receive them from state chairmen (see Tab B), and which are forwarded to other officer procurement districts for action, will not be included in the weekly report of the office forwarding them. Such requests will be included in the report of the office which does the processing.

For the Director:

EMMETT F. CONNELY,
Colonel, A. U. S.,
Chief, Field Operations Branch.

Relocation of Physicians

Reports received by the War Manpower Commission's Procurement and Assignment Service for Physicians, Dentists, and Veterinarians show that approximately 600 physicians have changed their places of residence and practice in the last few months, Chairman Paul V. McNutt announced on March 30, 1943. The Procurement and Assignment Service, a division of the Bureau of Placement, makes an effort to accomplish such relocations when the medical needs of the civilian population would be better served.

Figures compiled by the Procurement and Assignment Service come from 40 of the 48 states. Of a total of 587 relocations in these 40 states, 340 were directly due to action by the Procurement and Assignment Service. Five of the relocated physicians are women. A total of 214 of the 582 relocated male physicians are either over 45 years of age, or, if younger, disqualified for military service. Although it is known that there have also been relocations in Kentucky, Delaware, Louisiana, Minnesota, Virginia, West Virginia, Oklahoma, and Vermont, the figures have not been reported. In many instances, the Procurement and Assignment Service reported, the assumption of increased duties by a decreased number of physicians remaining in an area has been seen as the best solution to a community's health problem. In a number of states, ingenious medical-care plans have been worked out locally which enable fewer physicians to care for more civilians. Among such states are Maryland, California, Oregon, Michigan, and Arkansas.

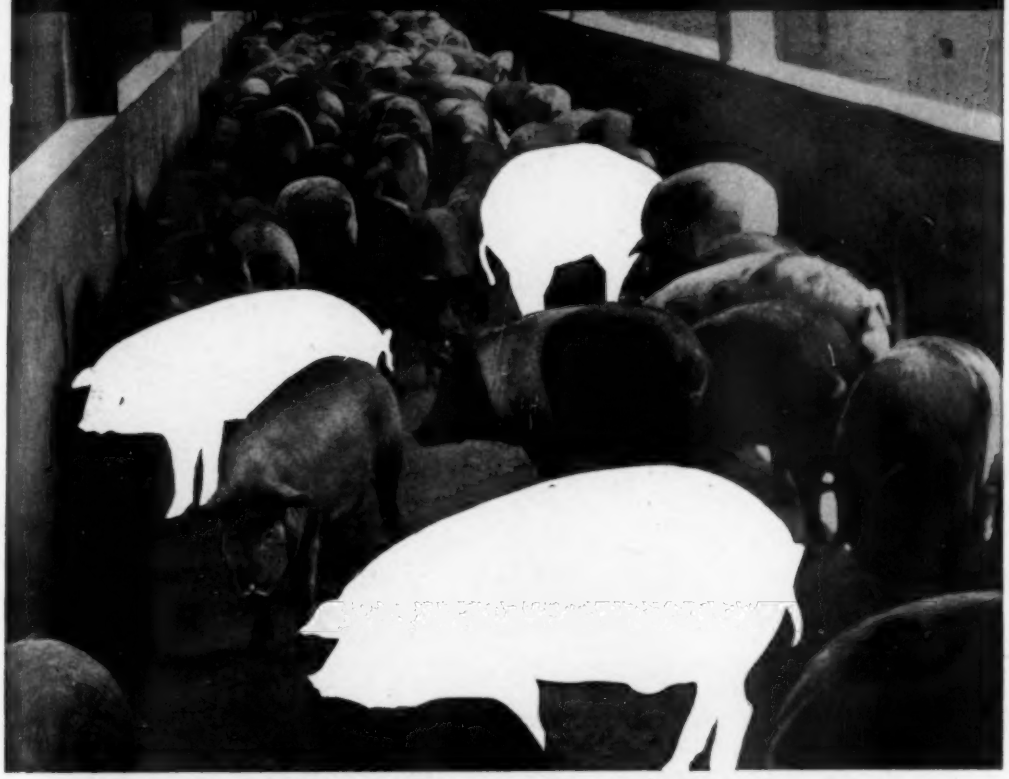
New Draft Classifications

The revised classifications ordered April 12, 1943, by Selective Service follow:

Classification	*Definition of Classification*
1-A	Available for military service.
1-A-O	Conscientious objector available for non-combatant military service.
1-C	Member of land or naval forces of the United States.
2-A	Man necessary in his essential civilian activity.
2-B	Man necessary to the war production program.
2-C	Man deferred by reason of his agricultural occupation or endeavor.
3-A	Man with child or children deferred by reason of maintaining bona fide family relationship.
3-C	Man with dependents who is regularly engaged in agricultural occupation or endeavor.
3-D	Man deferred because induction would cause extreme hardship and privation to a wife, child, or parent with whom he maintains a bona fide family relationship.
4-A	Man 45 years old, or over, who is deferred by reason of age.
4-B	Official deferred by law.
4-C	Neutral aliens requesting relief from liability for training and service, and aliens not acceptable to the armed forces.
4-D	Minister of religion or divinity student.
4-E	Conscientious objector available for work of national importance.
4-F	Physically, mentally, or morally unfit.
4-H	Men 38 to 45 now deferred because their age group is not being accepted for military service. (This group is being reclassified in case of eventual call.)

Did you know that the American Army officer buys War Bonds 'til it hurts and ne'er says a word about it? What's your batting average in this battle to save your neck?

HOW MANY WILL BE MISSING DUE TO *Swine Erysipelas?*



To quote Secretary of Agriculture Claude R. Wickard: "If we were to apply known methods of prevention and control of all livestock diseases as conscientiously as we have done in combatting some, we could . . . . increase the total output of products with little increase in the numbers of breeding stock." (1942 Yearbook of Agriculture, U. S. Dept. of Agriculture).

• • • • •

One disease requiring far better control, and for which suitable control measures are at hand, is Swine Erysipelas. Simultaneous immunization with a viable vaccine and a potent serum produces satisfactory immunity.

Cutter Anti-Swine Erysipelas Serum

Mouse-protection tested against a known standard highly potent serum.

100 cc., $2.00 less 10%. 250 cc., $4.00 less 10%. Immunizing dose 5 cc. to 20 cc. depending on weight.

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A viable pigeon-tested vaccine (available only in those states where "simultaneous" erysipelas immunization is authorized).

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An' Related Topics

1,500 Join K-9 Corps Every Month

—From Chicago Herald-American

Dr. W. A. Young and One of the Applicants

The dogs who want to join the Army must pass rigid examinations. Sight is a most important faculty when qualifying for the Corps, according to Dr. W. A. Young, chairman of the Chicago Veterinary Committee in the dog induction program. He is also managing director of The Anti-Cruelty Society of Chicago. Many fine, healthy dogs come up for examination and few are turned away, as most of them pass the tests with ease. It is believed that the K-9 Corps is in the Army to stay.

In 1790, John Philpot Curran told the American colonists that eternal vigilance was the price of the liberty they were fighting for. When the war was over, the said American people cut the Army down to exactly 86 officers and men.

If you enjoy the thrill of a hurricane, a typhoon, a violent whirlwind, cyclone, or volcanic eruption, just criticize some fellow's writing, grammar, rhetoric, syntax, or something.

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An' Related Topics

Cannibals Prefer Rare Varieties of Ma

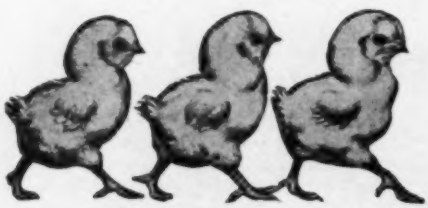
In our busy lives, we Americans are learning our first lesson on the raising of bipeds for food—our first lesson on the ways of the cannibal tribes which our soldiers are now actually contacting on a large scale. Stories about eating missionaries never made deep and lasting impressions. Now we get official *communiques* about folks who prefer human flesh as the entree of the daily menu or feast. Connoisseurs, we are told, prefer the tender flesh of women. Their arms, legs and breasts are more delectable than the tenderest leg of lamb or pork loin. However, the whole body is eaten, roasted in sago. And, believe it or not, as we once thought of buffalo herds and our present swine droves, some tribes in western New Guinea look upon neighboring tribes as a sure source of their meat supply. Strangers *(e. g.* white men) are preferred, just as we prefer moose

Akrodin Scarlet

Coccidial Diarrhoea of Cattle

Coccidiosis of Poultry

Keep 'Em Living



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An' Related Topics

or elk or deer which satisfies the appetite and does not deplete our store of pork and beef. There are folks in the American theater of operation, as of June, 1943, raising bipeds for food who would choke on the meat of sacred animals but do crave man meat, stewed, roasted, and broiled.

In its fling at colonization, finding markets for products of the tropics, and stepping up the lot of backward people, the British government and also the Netherlands, have done yeoman service in curtailing cannibalism by the man eaters. But the job remains incomplete. Perhaps, World War II is the work of Jehovah. Who knows?

Rationing is apt to get so serious that you may have to take some of the dark meat in lieu of the white, shoulder instead of ham, filet of sole instead of trout, and so on through all the miseries of the glutton.

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• Armour's N-S Powder provides sterilized medicinal bone powder, calcium lactate, calcium gluconate, and calcium carbonate precipitated, in a balanced formula developed after intensive study of the calf scour problem. Its function is to aid in the treatment of diarrheal conditions of dietary origin, and thus facilitate the return to normal digestion.

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Chemotherapy of
STAPHYLOCOCCUS INFECTIONS
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The chemotherapy of bacterial infections has developed in rapid strides. There are now available a number of sulfonamide compounds which have demonstrated antibacterial action in various types of infection. One of the most recent contributions in this field is Sulfathiazole (2-sulfanilamidothiazole).

Clinical observations have confirmed the experimental evidence that Sulfathiazole exerts a destructive action on staphylococci in animals. In addition, it has been shown that Sulfathiazole has merit in the treatment of infectious coryza in chickens.

As a wound dressing, Sulfathiazole is highly useful locally and in compound fractures. It has also been applied in the form of an ointment with good results.

Highly effective
ORALLY AND LOCALLY

How Supplied: Sulfathiazole-Winthrop is supplied in tablets of 0.5 Gm. (7.72 grains), bottles of 50, 100, 500 and 1000. Also in tablets of 0.25 Gm. (3.86 grains), bottles of 50, 100, 500 and 1000. In powder in bottles of 5 Gm., ¼ lb. and 1 lb.

Write for booklet which contains detailed information on indications, dosage, manner of use and side effects.

Specify SULFATHIAZOLE *—Winthrop—*

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The Question of Human Longevity

The decreased span of human life from around a thousand years to less than a hundred since the days of our biblical forefathers, is interesting. Whether due to lost arts or the coming of new factors is speculation. The increasing span within the memory of living men, however, indicates that the trend is upward. That the upward trend is not all due to lowered infant mortality is self-evident. The chemist, the physiologist, and the pathologist on the job have prolonged life during all of its periods (infant, youth, adult, aged), not only of childhood.

Although here for him to explore, the science of longevity seems to be too deep for the human being to fathom. Life came upon earth amid hissing steam and boiling mud, of incomputable duration, which the laboratory is unable to duplicate. Its coming created the problem of distinguishing between living and nonliving matter. It's all that simple, but in the eons of time, life is really a newcomer. It's only 600 million years old — too young for its one *curious creature* to figure out. Perhaps, the said curious creature was never intended to be that brilliant.

No living thing is as everlasting as the inorganics whence it came and which (inorganics) it tries to outsmart to perpetuate itself—to grow, to reproduce, to die. Doubtless, ageing is just as complex as these processes. In fact, the science of longevity, especially its minor branch (geriatics) which is intended to find ways to prolong the life of man, could be boiled down to finding out what happened on earth between the creation of Adam and the death of Joseph—the stretch of history covered in Genesis. All there's to do is solve the problem of "earth to earth and dust to dust." Thank you, there's no charge for the hunch.

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BACTO-PEPTONE is most widely used in routine culture media. It forms clear solutions with a reaction of pH 7.0.

BACTO-TRYPTONE is an excellent peptone for detection of indol and hydrogen sulfide production. It is recommended in "Standard Methods for the Examination of Dairy Products."

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PROTEOSE-PEPTONE is universally used for elaboration of diphtheria toxin. It is also employed in media for production of scarlet fever and botulinus toxins.

PROTEOSE-PEPTONE NO. 3 is particularly useful for propagation of many fastidious pathogenic bacteria.

NEOPEPTONE is especially recommended for isolation and cultivation of Pneumococci and Streptococci.

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● Even if you could get all the meat you wanted, the chances are you couldn't feed dogs any better than if you simply fed 'em Gaines! Just plain Gaines and water . . . and nothing else!

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What's more, Gaines appeal is a *lasting* appeal. Yes, dogs keep on eating Gaines, week after week, month after month, year after year, without tiring of its taste. That's another big reason why Gaines has been a leading favorite with breeders and veterinarians for over 15 years.

Send today for free professional samples of this great dog food, and test it in every way you wish. Prove to your own satisfaction that you need only Gaines and water to keep dogs fed right. Then, we are sure, you'll let Gaines solve the "meat-feeding problem" for you... and for your clients, too!

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. . . and that's how these puppies were born

THIS litter of healthy whelps may owe its existence to the aid of PERANDREN. This most powerful of the male sex hormones is making excellent therapeutic history in the treatment of selected cases of sexual impotence in small and large animals. One report cites tying within 48 hours after injection of *PERANDREN** with subsequent birth of healthy pups.

Too often one or more of the weaklings in a litter are lost within the first few hours after birth. *CORAMINE*, has proven of value in giving weaklings sufficient initial stimulation to save them. The therapeutic dosage is so markedly less than the toxic dose of *CORAMINE** that little fear need attend its use.

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An' Related Topics

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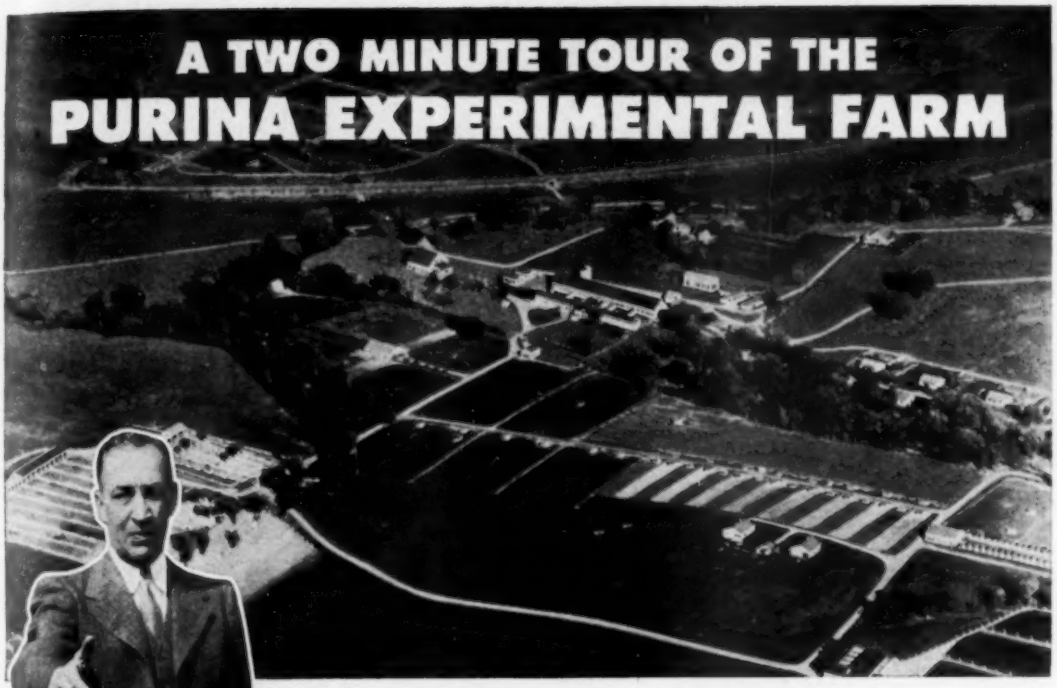
Letter received from a man in Kansas who seems convinced of their usefulness.

Dear Dr. ————, Vertinary Surgeon

I am in the market to buy some spayed mares. What state or county has the most spayed mares to sell. there must be quite a few spayed mares in Chicago, N. Y. & Illinois, Texas, Mich., Ind., Ohio, Kan., Mo. let me know what state has a few spayed mares. I am in the market to buy some spayed mares. My boys said they would like very much to have some spayed mares, use them to ride to school on & Lady Broke. those kinds of mares has their ovaries out & there tame for school boys and girls to ride to school on & they use them in Riding Academys & city park rides & mt. trails & polo & Racing & driving steers with & saddle on them for korraling & riding & rounding in bull calves to nut them & spayed mares are used to hold the rope on there saddle, pulling up rope on bull calves that are tied thrown & held down in recumbent position & nutted. There just fine for driving steers & mares with as they dont kick or bite as much as breeding mares do you know & there easy to catch & bridle & harness & fine for plowing & all kinds of work. Docile & Fatten quick. One spayed mare is worth more in work value & riding cause they dont eat much & sexual desire has all disspeared from the mares & sexual excitement & horseing in heat has vanished almost imediatley with removal of ovaries. The results are excellent. There the only kind of mares I can work & ride you know. Let me know what good breeder would have some for sale in Ill., Mo., Kans., would like to buy some of them close to me here. more veterinary surgeon ought to spay a few more mares for farmers. I been trying to buy few spayed mares for my boys to ride to school on I dont know how to spay mares, the flank would be the easiest way I think. How much does veterinary spaying surgeon charge for removing the ovaries from young mares & how much is a spayed mare a head to buy her. I want mare not to high in price as spayed mares auto be

A TWO MINUTE TOUR OF THE PURINA EXPERIMENTAL FARM



THE PURINA EXPERIMENTAL FARM at Gray Summit, Missouri, was placed in operation on January 15, 1926. Its purpose was to carry on nutritional research for the continuous improvement of Purina Chows to give the livestock feeder the most nutritional value for his feed dollar. Purina Farm research is aimed at providing nutritionally balanced feeds which, if fed according to recommended Purina Programs, will help livestock produce to the limit of their bred-in capacity.

The Purina Farm, of 544 acres, has a staff of 90 men. Of these, 18 are college graduates or have special training in their field. The animal population is 2,000 and the poultry population is 15,000. Feeding experiments are carried on with beef cattle, cows and goats, hogs, chickens, turkeys, ducks, dogs, foxes, minks, marten, chinchillas and rabbits.

844 separate experiments have been completed in the 17-year history of the Farm. World records in hog production and turkey egg production have been achieved.

In normal times, 6,000 to 10,000 feeders visit the Farm each year. Managers of Farm departments freely share their experience in breeding, feeding, sanitation and management problems with these visitors. Purina Mills serves the livestock feeder through these activities in behalf of *more production* at *low cost*.

Watch this space for the continuing story of Purina Farm Research. Following ads will give more detailed accounts of work carried on by major departments of the Farm.

MEET E. B. POWELL, Manager of the Purina Experimental Farm! E. B. Powell, farm raised, received his B.S. and Master's degrees from the Missouri University College of Agriculture. He came to Purina as farm manager shortly after completing his education. Powell is author of scientific papers on dairy science and animal nutrition. He conducts a class in Practical Farming at Washington University and is a member of the following societies: American Farm Managers and Rural Appraisers Ass'n., Dairy Science Ass'n., American Society of Animal Production, Holstein Breeders Ass'n., Gamma Sigma Delta, Sigma Zi, and is a Trustee of the Missouri University Agricultural Research Foundation.

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Philadelphia Pennsylvania

An' Related Topics

cheaper than breeding mares as you know. Write me soon as you can & thank you & oblige.

I live on a farm & I need spayed mares to plow and haul feed with & list corn & harrow & disc & mow hay & rake & plant potatoes & cultivate corn & haul grain to market & that where I need tame spayed mare. When troublesome mares are spayed they are tame. When the troublesome ovaries are removed they are humble & quiet & sexual desire all vanished after they heal up. I want to buy some spayed mares. What breeds of spayed mares are the best (send me a list of a few breeders) that you know has them & tell them to write me as I am in the market to buy spayed mares & send me some literature on how mares & milk cows are spayed. dont want to high priced mares. mare from $25. to 50.00 for ovaried mares & Lady Broke. write soon.

yours truly

& send me your latest vet catalogue. there aint no vetrinary around here & dont think they know how to remove the troublesome ovaries from mares (and is Lady Broke for Ladies and Boys to ride on) & send me your new latest vetinary catalogue & latest vetrinary Books that shows in pictures of tieing throwing down & holding & nutting stallon colts in Recumbent Pst & in Standing Position & shows in pictures of tieing & throwing down & holding & spaying young mares in Recumbent pst & standing position & shows latest vet nutting instruments to nut stallon colts with & shows latest vet spaying instruments to spay young mares with & prices.

There a big demand for spayed mare in cities to ride on for ladies rides on them in mt Trails & polo & riding academys & rounding up steers in the stockyards & Ladies rides them in Horse Shows & Fairs & movies & Circus & High School spayed mares & Trained & trick canter & Trotting & Dancing spayed mares for Ladies to ride on & Lady Broke & for country club riding & Bridle Path & write soon .....

Of course, her dog goes for Red Heart *3-flavor* Dog Biscuits. And why not? After all, these popular, time-tested biscuits furnish abundant supplies of essential Vitamins A, B Complex, D, E, and unsaturated fatty acids—as well as calcium, phosphorus, iron, copper, and other necessary trace minerals.

But that's not all! *3 delicious flavors*—beef, fish, and cheese—in every carton and bag give dogs plenty of appetizing taste variety. Feed and recommend Red Heart Dog Biscuits with confidence. For kennel feeding, they are available heart-shaped or kibbled in 25-, 50-, and 100-lb. bags.

If your dealer cannot supply you, write:

JOHN MORRELL & CO., General Offices: OTTUMWA, IOWA

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RED HEART THE 3 FLAVOR **DOG BISCUITS**

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The hospital is complete with all new modern equipment including: Empaco hydraulic table, triple objective microscope, Pelton cabinet sterilizer, Cameron diagnostic lights, all necessary instruments, X-ray, fluoroscope, and ultraviolet lights.

The business is highly profitable because the overhead is extremely low. Operating personnel: one veterinarian and one porter.

Income 1942: Over $10,000 gross. Will sell entire business including buildings and complete hospital equipment for $13,285.

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Hands are scarce, neighbors are busy—so use this handy holder on your hogs, save time and trouble. Simply slip well back in mouth, turn handle forward. He's under your control in a twinkling—and KEPT there, for examination or treatment! Only gentle pressure required, injury avoided. One end for large hogs, other for pigs. Developed by practicing veterinarian; durable, good for a lifetime. Needed on every farm. Send $1.50 today—postpaid anywhere.
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YOUR MONEY BACK IF NOT SATISFIED

An' Related Topics

Rube—Hayseed—Country Jake

What a transition! In the short lifetime of a septuagenarian, American townfolk have changed — changed in decorum, changed in fiscal policy, changed in heart, perhaps, toward the rural population tilling the soil around them. When the farmer's boy went to town, sons of the blacksmith, of the merchant, and of the banker once called him a country jake. High hatting was a fine art, snobbery a finished science. The sprouting 400's aped the antics of the blue-blooded royalist. The farm boy who made the high school in fur cap and brogans was an outcast—except in the classroom. Dad was a rube, a hayseed, except when he drove in to vote for the county machine. In the upper bracket of politics, he was handled with soft gloves. He represented the farmers' vote which could

GUARANTEED TO GIVE SATISFACTION

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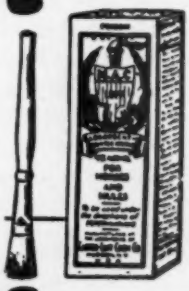

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PENTOTHAL SODIUM

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A competent veterinarian, not eligible for the Draft, with knowledge of treatment of large and small animals, to assist in Hospital established in 1905. Opportunity for steady advancement and excellent salary. Address "MC," c/o Journal of the AVMA.

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New or used Stader splints. Describe condition and name price in reply. Address "AG," c/o Journal of the AVMA.

Recent graduate, single, as assistant in large animal practice—Middle West. Good opportunity, salary and working conditions. Give age, experience and references. Address "SN," c/o Journal of the AVMA.

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An' Related Topics

never be laughed off like the plain-dressed boys and girls who came to the county fair.

On the ball team, the fastest balls and biggest curves came over the plate from the brawny arms of the country jakes. It would have been hard to find a town boy game enough to catch "behind the bat" before the coming of pads and masks. The town-boy catchers took them "on the bounce," twenty feet back, before the country jakes came into the high school team. When more dads were able to send the oldest boy to high school, the ball team became rural, so when the nifty team in new suits came over for a game, the honor of the school was at stake 'til the country jakes shut 'em out. The town boys sat in the bleachers behind the screen for mother's sake. Precious offspring must not get hurt at a horrid ball game. And, Arthur, don't forget your fur-lined coat. It might get chilly.

But, phooey on Anson and his White Sox! Football's the game and no one west of the Hudson can play that. Football in Minnesota and Iowa! What a laugh!

But, what we started to say is that no one among the townfolks could have dreamt that in 1943 these country jakes would be found ready and willing to feed a hungry world, to have an agricultural college in every state, a farm adviser in every county, and a farm bloc in Congress that can throw fast ones, curves, and screw balls to the dismay of the townfolks in the bleachers. Discounting the potentiality of the country jake and his output stands out like a sore thumb on the hands of the blundering American politicians, few of whom know that the farmer and his livestock are the pioneer infantry of this civilization and the veterinary profession the vitamer of its deficiency disorders. What a transition!

IN CANKER
OTORRHEA
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Veterinary Division THE DOHO CHEMICAL CORPORATION NEW YORK - MONTREAL - LONDON

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Tankage 60%	6.21%	3.42%
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VEGETABLE Proteins Contain	Calcium	Phosphorus
Alfalfa Meal	1.31%	.17%
Linseed Oil Meal	.33%	.86%
Soybean Meal	.28%	.66%
Cottonseed Meal	.24%	1.11%

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This free service gives you—(1) analyses of your clients' own home made or local mill mixed feeds; (2) makes suggestions for changing over from ANIMAL to available VEGETABLE Proteins; (3) shows how much more VEGETABLE Proteins are needed to make balanced rations than where ANIMAL Proteins are used. (4) tells you how much more Calcium, Phosphorus and Vitamins your clients' feeds need when VEGETABLE Proteins are used; (5) gives your clients economical-to-make yet profitable-to-feed "tailor-made" formulas that need only home grown grains, legumes, roughages and the Proteins your clients can get in their own local market.

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SWIFT'S
DOG FOOD

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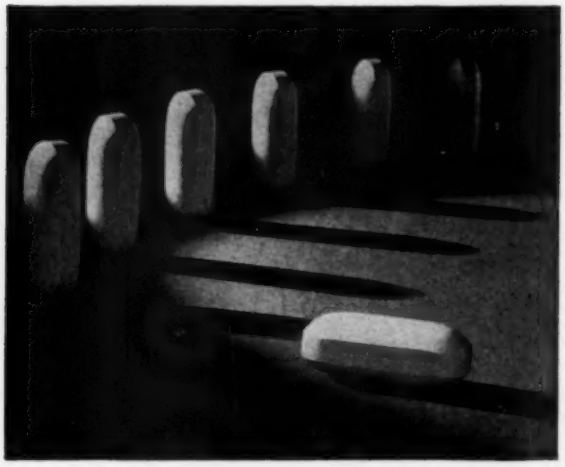
An' Related Topics

Food and Beer

Inasmuch as 4 per cent of the total of g available grain in Great Britain is ma into beer, disputes have arisen as t whether food is wasted thereby. Those o posed to beer contend that this gra should be fed to pigs and poultry in ord to increase food production. Others, on th contrary, set out to prove that making gra into beer is actually a food-conservi measure. The University of London com to the rescue of the brewers in a repo showing that but 25 per cent of the foo value of grain is extracted in brewing; th rest goes back to the farm in the form o brewers' grain. Summed up the Britis cabinet decided in favor of beer making "i the public interest."

The nations of the Western Hemisphere accumulated a lot of wealth and freedom, while conquering monsters waited for the coming of "der tag."



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